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MICHAEL LEE LOPEZ

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THE RELATIONSHIP BETWEEN RECURRENT OTITIS MEDIA AND PARENT-CHILD INTERACTIONS

By

Michael Lee Lopez

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ABSTRACT

THE RELATIONSHIP BETWEEN RECURRENT OTITIS MEDIA AND PARENT-CHILD INTERACTIONS

By

Michael Lee Lopez

The purpose of the present study was to assess relationships among ROM, child behavior and parent-child interactions for a group of families with children (n = 56) who had varying degrees of recurrent otitis media (ROM) during the first three years of life. It was anticipated that the quality of parent-child interactions would play a role in moderating the deleterious effects of ROM on children's behavioral functioning. Data analyses tested two alternative models postulating relationships between the severity of children's ROM during the first three years of life, style of parental interactive behavior (parental warmth and parental control), and children's behavioral adjustment at three to four years of age.

The first model, the "independent influence" model, postulates that ROM severity and style of parental interactive behavior (parental warmth and control) independently influence children's behavioral adjustment, with ROM having a direct and indirect effect on adjustment. The second model, the "buffering" model, argues that an effective style of parental interactive behavior buffers the deleterious effects of ROM on children's behavior.

In general, the findings provided little support for the "independent influence" model. A history of ROM predicted neither children's negative behavior, nor parental

warmth or control during the structured, laboratory parent-child interaction task, with a single exception. In contrast, some support was found for the "buffering" model in that the results suggest style of parental interactive behavior may moderate the relationship between ROM and child behavior problems; however the findings were not always in the predicted direction. In particular, 1) ROM severity interacted with maternal warmth, and 2) ROM severity interacted with maternal control and child sex in predicting child negative behavior during the structured, laboratory play task. The findings from the present study indicate that health care providers need to become more aware of the multiple factors that determine the impact an illness such as ROM may have on children's emotional and behavioral adjustment, especially given that parents may be in the unique position to moderate the effects of illness on their children's psychosocial adjustment.

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Introduction

In recent years, researchers have begun to focus their attention on the negative impact that childhood illnesses may have on the psychosocial development and adjustment of young children and their families. The negative impact of illness on a child's development can be especially severe during the earliest years of life, when the child is undergoing development at a rapid pace (Perrin & Ferrity, 1984; Travis, 1976).

Otitis media is one of the most commonly treated illnesses in preschool-age children (Koch, 1974; Schappert, 1992; Stool et al., 1994; Teele, Klein & Rosner, 1983). Recurrent otitis media (ROM) has been defined as an incidence of two or more episodes of acute otitis media occurring within a six month period, or three or more episodes occurring within a twelve month period of time (Forgays, Hasazi & Wasserman, 1992; Vernon-Feagans, Manlove & Volling, 1986; Wallace, Gravel, Schwartz & Ruben, 1996). The illness typically involves the inflammation of the eustachian tube and middle ear, with pus filling the middle ear cavity, resulting in what is commonly referred to as effusion. In time, the inflammation will subside by itself, but often it is treated with an antimicrobial agent. Once the inflammation subsides, the fluid in the middle ear either drains through the eustachian tube, or is reabsorbed by the surrounding tissue (Paradise, 1981).

In 1982 alone, otitis media accounted for an estimated total of 21 million patient visits to health professionals (National Drug Therapeutic Index, IMS America, New York). It has been estimated that by the age of three, more than two-thirds of all children will have had at least one episode of otitis media, one-third will have had at least three

episodes, and an even smaller percentage will experience episodes on a regular basis for the first few years of life (Daly, 1991; Teele, Klein, & Rosner, 1989). Given the high prevalence of recurrent otitis media (ROM) in young children, it is important to investigate whether or not a severe history of the illness contributes to disruptions in normal social development.

Otitis media, itself, often results in secondary effects of irritability, inattentiveness, and/or fluctuating hearing loss (Bluestone et al. 1983; Forgays, Hasazi, & Wasserman, 1992; Roberts et al., 1995). Any one of these secondary effects would likely have a direct influence on a child's temperament and/or behavior, and an indirect impact upon a parent's ability to effectively interact with the child.

It has also been suggested that ROM may have a negative impact upon a child's speech and language development, due to the fluctuating and/or permanent hearing loss that is frequently experienced (e.g., Bluestone et al., 1983; Chan, Logan, & McBean, 1967, Downs, 1983; Fria, Cantekin & Eichler, 1985; Roberts et al., 1995). If a child's speech and language development is delayed, such a delay would further contribute to disruptions in parent-child interactions by increasing communication difficulties between a parent and child, and by disrupting the normal development of important self-regulatory mechanisms within the child. Thus, it appears that ROM may have a direct negative impact upon children's behavior and/or social and emotional adjustment, as well as an indirect negative impact upon parent-child interactive behavior. The relationships probably are bidirectional, with respect to their direction of influence, especially when considering the role that stress and/or certain parenting practices might have on a child's susceptibility to illnesses, in general. However, given the relative importance of

evaluating the impact of an illness on children's adjustment and related parenting behaviors, the focus of the present study was limited to an examination of the impact that ROM may have upon both child and parent behaviors, rather than vice versa.

The potential negative impact of a childhood illness may be most significant during the preschool years, when children are undergoing a process of rapid social and emotional development (Perrin & Ferrity, 1984; Travis, 1976). During the second and third years of life, children rapidly become more autonomous as they move through the separation-individuation process (Erikson, 1963; Mahler, Pine, & Bergman, 1975). Parents begin to provide children with the structure and contingencies necessary for the development of self-regulatory mechanisms by making more demands for appropriate behavior, and imposing more restrictions on behaviors that fall outside the range of acceptable child behavior (Kopp, 1987; Parpal & Maccoby, 1985). It is also at this stage of development that children become increasingly able to use language and representational imitation to reproduce the appropriate responses that are expected by their parents, control their own behavior, and communicate more clearly with others (Bandura, 1971; Smetana, 1994; Vygotsky, 1962). Thus, a major focus of parenting at this age is preparing children for appropriate involvement in social relationships as they begin to function more independently from their parents and are expected to assume more control over the regulation of their own behavior (Kochanska et al., 1987).

Within the socialization literature, two clusters or dimensions of parenting behavior consistently have been cited as essential components of effective parenting: (1) parental warmth or responsiveness, and (2) parental control (Baumrind, 1967, 1968, 1971, 1988; Martin, 1987; Maccoby, 1983, 1992; Maccoby & Martin, 1983; Smetana,

1994). The dimension of parental warmth generally refers to a cluster of behaviors that contain a strong affective component, indicating either approval or disapproval of children's behavior. Examples of behaviors reflecting parental warmth include smiles, praise, approval, encouragement, physical affection, and responsiveness to children's needs (MacDonald, 1994; Straus & Tallman, 1971). On the other end of the continuum, hostility would be manifested by such behaviors as criticism, sarcasm, negative evaluations, corrections, and disapproval.

The second dimension, parental control, often refers to those behaviors which reflect a parent's efforts to influence or otherwise exert control over the behavior of their children. However, one of the major limitations of the socialization literature has been the various ways that parental control has been defined. Too often, researchers have combined negative and/or ineffective control techniques, such as punishment, yelling, threats, vague directives, and deprivation of privileges, with more positive power-assertive control behaviors, namely clearly stated commands and directives (e.g., Darling & Steinberg, 1993; Maccoby & Martin, 1983; Rollins & Thomas, 1979; Steinmetz, 1979).

There are clear distinctions between these two types of parental control attempts. The first group of behaviors reflect parental punitiveness, coerciveness, or ineffectiveness and can be viewed as "functionally superfluous" control methods which may be accompanied by strong negative affect (Lepper, 1981; Maccoby & Martin, 1983; Smetana, 1994). On the other hand, clear parental commands and directives represent consistent discipline techniques often used to effectively influence children's behavior (e.g., Baumrind, 1971, 1988; Darling & Steinberg, 1993; Forehand & McMahon, 1981;

Patterson, 1982). Thus, it is important to distinguish between such positive parental directives and the more negative, punitive, or ineffective control attempts.

In general, studies have shown that children's behavioral and social adjustment is maximized when parents adopt a style of parenting that balances high levels of parental warmth and positive control (Ainsworth, 1979; Baumrind, 1971; Lay, Waters & Park, 1989; Lemanek, Stone & Fishel, 1993; Rocisano, Slade, & Lynch, 1987; Rothbaum, Rosen, Pott & Beatty, 1995; Schaffer & Crook, 1980; Wakschlag & Hans, 1997). In summarizing the research on the dimensions of parenting, Martin (1987) concluded that "the processes involved in warmth and control are most profitably viewed in interactive terms. Harmonious interactions between parent and child are more likely to result when parental control efforts are sensitive to and moderated by the infant's or child's state, in other words, when accompanied by many of the qualities summarized as warmth" (1987, p.183). Similarly, both Maccoby (1983, 1992; Maccoby & Martin, 1983) and Kochanska (1997) have argued that the socialization process involves inducting the child into a reciprocal orientation or system of reciprocity, in which the development of a mutually responsive relationship between parent and child, over time, results in a decreased need for parental control behaviors. Thus, it is through the development of this mutually responsive relationship that children gradually internalize their parent's goals and values, thereby reducing the need for parental coercion or control.

It is important to note that related studies have shown that more ineffective styles of parenting can directly and/or indirectly result in an increase in the level of stress experienced by children (Elder, Caspi, & Downey, 1988; Jouriles, Barling, & O'Leary, 1987; Patterson, 1982). Furthermore, it has also been suggested that exposure to high

levels of stress can substantially increase children's susceptibility to various illness processes (Stein & Jessop, 1984; Boyce, Jensen, Cassel et al., 1977). However, for heuristic purposes, the focus of the present study was limited to an examination of the potential impact that a particular childhood illness has on children's behavior and parent-child interactive behavior, rather than the potential effect of stress leading to childhood illness.

Certain stressors, such as childhood illnesses, may impinge upon the early socialization process by disrupting the normal maturation and/or attainment of developmental milestones (Cerreto, 1986). Such a disruption to the child's socialization likely may occur if the stressor directly impacts the child's temperament, and/or indirectly influences the child's interactions with his/her parent(s).

It has been argued that over an extended period of time, a child with a "difficult" temperament may gradually become an aversive stimulus for a parent, through the process of conditioning (Lamb, 1978). Such conditioning, might then lead the parent to become less warm, responsive, and sensitive to the child's needs, thereby placing the child in a vulnerable position for the development of interpersonal and developmental difficulties (Donovan, Leavitt, & Balling, 1978). Thus, a childhood illness, such as ROM, not only may have a direct negative effect upon a child's temperament and/or development, but also may indirectly affect parent-child interactive behavior.

Previous studies examining the impact of ROM on children's development have found that parents report more behavior problems for children with histories of ROM, compared to children without histories of ROM (Casey, 1983; Feagans & Proctor, 1994; Forgays, Hasazi & Wasserman, 1992; Gottleib, Zinkus, & Thompson, 1979; Roberts,

Burchinal & Campbell, 1994; Vernon-Feagans, Manlove & Volling, 1996). Researchers have thus inferred that a severe history of otitis media may have a direct negative impact upon children's behavior and an indirect impact upon their parent's behavior, thereby resulting in potentially dysfunctional parent-child interactions (Black et al., 1988; Black & Sonnenschein, 1993; Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Freeark et al., 1992; Roberts et al., 1995; Wallace, Gravel, Schwartz & Ruben, 1996).

However, only recently have investigators begun to move beyond the reliance on self-report data by including actual assessments of the relationship between recurrent otitis media and parent-child interactions (Black et al., 1988; Black & Sonnenschein, 1993; Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Freeark et al., 1992; Roberts et al., 1995; Wallace, Gravel, Schwartz & Ruben, 1996). In one study, Black et al. (1988) found that mothers of one to two year old children with histories of recurrent otitis media were less warm and sociable when interacting with their young children, than were mothers of children with less severe histories of otitis media. Freeark et al. (1992) in examining the impact of recurrent otitis media on children's verbal abilities, found that parental verbal stimulation moderated the effects of otitis media on language development in a sample of three to four year old children. Similarly, Wallace et al. (1996) investigated the association between early otitis media, style of parent interaction behavior and children's language development. The results of the study suggest that high maternal verbal stimulation was associated with better language skills, whereas high levels of observed maternal control behavior, during a laboratory interaction task, was associated with low scores on measures of expressive language development. Thus, maternal control had a negative, rather than positive association with the child outcome of

interest, expressive language development.

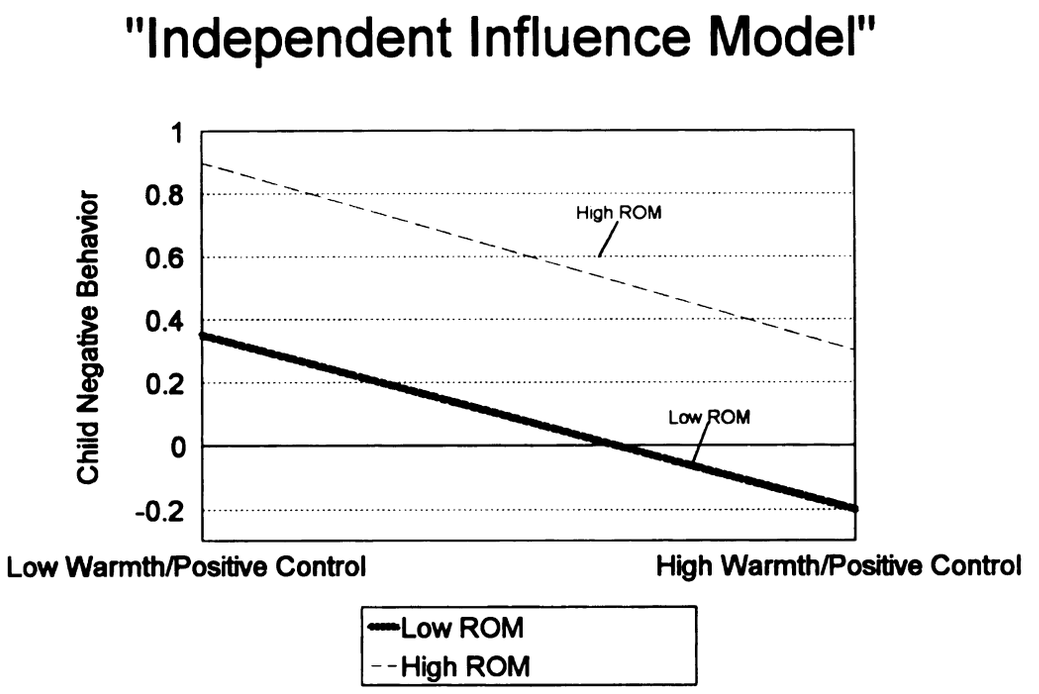
In a related prospective longitudinal study of 61 infants, Roberts et al. (1995) found an association between otitis media and subsequent hearing loss, language and cognitive outcomes, but only when parenting style and quality of the home environments were taken into account. This latter study supported a multifactorial model of development within the context of exposure to early otitis media. In combination with other recent studies, it underscores the important moderating role that family factors, such as parent interaction style, play in minimizing the impact of otitis media on children's development. These recent studies also emphasize the likely transactional nature of the relationship between early exposure to otitis media and the quality of parenting behaviors and/or the home environment, as critical determinants of children's subsequent cognitive, language and socioemotional development. Based upon this review of the existing literature, it is clear that additional research is needed in order to confirm and extend the findings from these previous studies. In particular, research to date suggests several hypotheses that will be investigated within the context of the present study.

Overview of the Hypotheses

The purpose of the present study was to assess the relationships among ROM, child behavior and parent-child interactions, for a group of families with children who had varying degrees of ROM during the first three years of life. It was anticipated that the quality of parent-child interactions would play a role in moderating the deleterious effects of ROM on children's behavioral functioning. Two alternative models of the relationship between the severity of children's ROM during the first three years of life, style of parent interactive behavior (parental warmth and parental control), and children's behavioral adjustment at three to four years of age were tested (See Figure 1).

The first model, the "independent influence" model, postulates that an early history of ROM and style of parent interactive behavior (parental warmth and control) independently influence children's behavioral adjustment. According to this model, recurrent otitis media and parenting independently contribute to children's behavior so that children who have suffered from severe histories of ROM will be better adjusted if they are exposed to effective parenting behavior (both high parental warmth and positive parental control), but would not be as adjusted as children without early histories of ROM who also are exposed to effective parenting behavior.

The second model, the "buffering model", argues that an effective style of parent interactive behavior buffers the deleterious effects of ROM on child behavior. Thus, those children with severe histories of ROM exposed to less effective parent interactive behavior will exhibit behavioral adjustment problems. However, children with histories of ROM who were exposed to effective parent interactive behavior will be as well



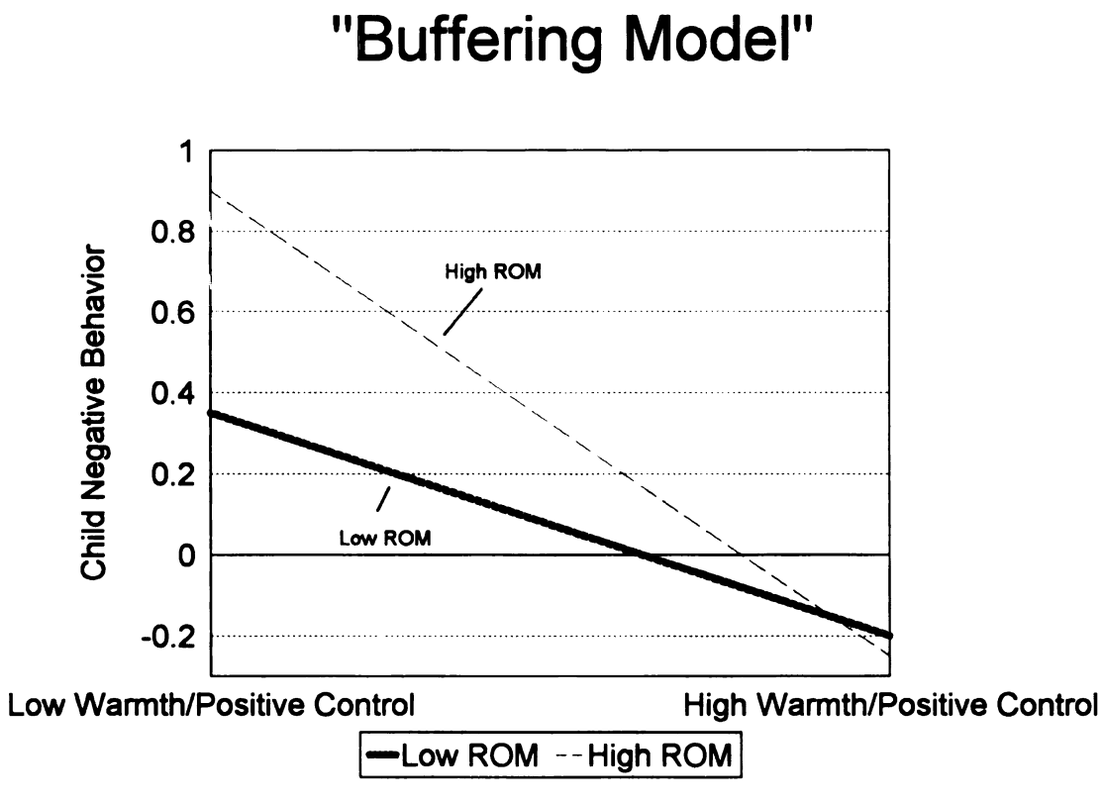


Figure 1: Two alternative models suggesting the relationship between (a) ROM severity, (b) style of parenting, and (c) children's negative behavior.

adjusted as children raised in similar environments, but without severe histories of ROM.

Hypotheses 1 and 2 tested components of the "independent influence model", and Hypothesis 3 tested the "buffering model". Data on both child and parent behavior were collected during a behavioral observation task that included three segments varying in structure from less to more structure. These tasks involved child-directed play, parent-directed play and parent initiated clean-up. In general, it was expected that there would be greater support for one or the other hypothesis as the structure and situational demands of the observed parent-child interaction task increased. Given that parent-child interactions were being assessed during increasingly demanding tasks, designed to elicit more negative behavior and demands for greater parental control, it was during these increasingly demanding tasks that the deleterious effects of ROM were most likely to be observed.

Hypothesis 1.

A severe history of ROM during the first three years of life will be positively associated with a greater number of child behavior problems (as observed during parent-child interactions in the laboratory), when compared to children who had experienced fewer and less severe episodes of otitis media.

Hypothesis 2

A history of severe ROM also will have an indirect impact upon parenting behaviors; ie. a history of ROM will be positively associated with observations of less effective parent-interactive behaviors (both lower levels of parental warmth and positive parental control). Similarly, less effective parenting behavior will be positively associated with a greater number of child behavior problems during the observed parent-child interactions.

Hypothesis 3

Finally, more effective parenting behaviors, defined by greater parental warmth and positive parental control behavior, will moderate the potentially deleterious effects of ROM on children's behavioral problems, as evidenced by fewer observed child behavior problems during the parent-child interactions.

Literature Review

Otitis media: Epidemiology

Otitis media with effusion is one of the most common illnesses experienced by young children (Koch, 1974; Schappert, 1992; Stool et al., 1994; Teele, Klein & Rosner, 1983). In one early study, 85 percent of the 7-1/2 to 13-1/2 year old children who had been followed in a private clinic for a minimum of five years, had at least one episode of otitis media at some point in their lives (Brownlee, DeLoache, Cowan, & Jackson, 1969). In another epidemiological study, 93 percent of the children who had been followed from birth to age 7 years, experienced at least one episode of otitis media (Teele, et al, 1989).

In the year 1982 alone, it was estimated that otitis media accounted for a total of 21 million patient visits to health professionals (National Drug Therapeutic Index, IMS America, New York). Other estimates calculate that otitis media is diagnosed in approximately 1/3 of all visits to physicians for illness (Bluestone, et al., 1986; Teele et al., 1983).

During the first year of life, the incidence rate for otitis media has been found to be as low as 14 percent (Brownlee, DeLoache, Cowan, & Jackson, 1969) and 23 percent (Teele et al., 1983) in some studies, and as high as 51 percent (Pukander, Sipila, & Karma, 1984), 73 percent (Marchant, Shurin, Turczyk, et al., 1984) and 91 percent (Gravel, McCarton & Ruben, 1988), in other studies. By the age of three, it has been estimated that more than two-thirds of all children will have had at least one episode of otitis media with effusion, one-third will have had at least three episodes, and an even smaller percentage will experience considerably more episodes (Daly, 1991; Teele, Klein, & Rosner, 1989). It is this last group of children that often will have their first episode

several months after birth, and will continue to have recurring episodes on a regular basis over the first three years of life.

Recurrent otitis media (ROM) has been defined as an incidence of two or more episodes of acute otitis media occurring within a six month period, or three or more episodes occurring within a twelve month period of time (Forgays, Hasazi & Wasserman, 1992; Vernon-Feagans, Manlove & Volling, 1986; Wallace, Gravel, Schwartz & Ruben, 1996). The illness typically involves the inflammation of the eustachian tube and middle ear, with pus filling the middle ear cavity, resulting in what is commonly referred to as effusion. In time, the inflammation will subside by itself, but often it is treated with an antimicrobial agent. Once the inflammation subsides, the fluid in the middle ear either drains through the eustachian tube, or is reabsorbed by the surrounding tissue (Paradise, 1981).

The actual duration of an episode of otitis media can vary anywhere from a few days to a year, or longer. However, the average duration of an episode ranges from one to three months (Hartsen, Prellner & Heldrep, 1989; Marchant, et al., 1984; Paradise, 1981). With respect to the duration of the illness, it is important to distinguish between the length of the acute infection, which often can resolve in 7-10 days, and the duration of the effusion, which is more likely to persist long after the infection has cleared. It is the effusion that has an average duration of one to three months.

Secondary symptoms often associated with episodes of otitis media include: acute pain, decreased hearing, malaise, fussiness, and irritability (Bluestone et al., 1983; Forgays, Hasazi, & Wasserman, 1992; Roberts, et al., 1995). During the acute phase of the illness, children also may have trouble with concentration, and with sleeping at night.

A temporary conductive hearing loss accompanying otitis media with effusion is quite common and can vary anywhere from 20 to 40 decibels in magnitude (Bluestone et al., 1983; Chan, Logan, & McBean, 1967, Downs, 1983; Fria, Cantekin & Eichler, 1985; Roberts et al., 1995). Hearing losses of 15 to 30 decibels are typically considered mild, while losses between 31 to 50 decibels are considered moderate (Northern & Downs, 1974). With a mild to moderate loss of hearing, a child will be able to understand speech only under optimal conditions (Holm & Kunze, 1969). That is, the child will have difficulty understanding what is being said by another person, unless that person is directly in front of him/her and speaking in a loud tone of voice. As a final note on the epidemiology of ROM, several studies have found that the age of the first episode of otitis media is negatively correlated with the total number of episodes, the duration of an episode, and/or the amount of hearing loss experienced (Casey, 1983; Daly, 1991; Teele et al., 1989). These findings suggests that the earlier the onset of ROM, the greater the potential for the development of subsequent problems related to otitis media.

Research on recurrent otitis media (ROM)

Various studies have shown that ROM occurring during the first one to three years of life may be associated with learning difficulties (Feagans, Sanyal, Henderson, et al, 1987; Howie, 1980, Teele et al., 1990; Zinkus & Gottlieb, 1980), speech and language impairments (Friel-Patti & Finitzo, 1990; Gottlieb, Zinkus, & Thompson, 1979; Lehmann, Charron, Kummer, et al, 1979; Teele et al., 1990; Ventry, 1980), and various behavioral problems (Casey, 1983; Feagans & Proctor, 1994; Forgays, Hasazi & Wasserman, 1992; Gottleib, Zinkus, & Thompson, 1979; Roberts, Burchinal & Campbell, 1994; Vernon-Feagans, Manlove & Volling, 1996). Iverson (1987) found significant correlations

between a history of ear infections and subsequent communication deficits (r=.35), attentional deficits (r=.32), tantrums (r=.22), and "detachment" (r=.21) in a sample of 122 children between the ages of three and 12-1/2 years old. It should be noted, however, that this data was primarily based on retrospective parental reports, and thus must be interpreted with caution.

Other studies have emphasized the importance of assessing the impact of the illness itself on the family's ability to cope with the stress of having a child suffering from a chronic illness, such as ROM (Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Tavormina, Boll, Dunn, Luscomb, & Taylor, 1981). However, only a few of the previously mentioned studies have actually attempted to examine the complex interaction between ROM and different aspects of family functioning (Black et al., 1988; Black & Sonnenschein, 1993; Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Freeark et al., 1992).

In one such study, Casey (1983) investigated the impact of ROM on the cognitive abilities, verbal abilities, reported behavioral problems, and parent's perceptions of stress among 60 children between the ages of four and five. ROM was defined by the following: (1) the children must have had their first episode of otitis media in their first year of life, and (2) they must have had no fewer than three episodes of otitis media during each of the first three years of life. The results indicated that ROM did not have an impact upon cognitive abilities, yet was related to a higher number of reported behavior problems and significantly greater amounts of parentally reported stress.

One of the major limitations of the study was the sole reliance on parental reports for information regarding the frequency and duration of otitis media episodes. A second

limitation of the study involved the operational definition of otitis media. The participants were selected based solely on parental reports of the frequency of otitis media episodes, without consideration for the variability in duration of the infection itself or the effusion that often accompanies the infection (Hartsen, Prellner & Heldrep, 1989; Marchant, et al., 1984; Paradise, 1981). Such inclusion criterion may mask important functional deficits that result from the multiplicative effects of the frequency, intensity, and duration of otitis media episodes, rather than from any one aspect alone.

In another related study (Forgays, Hasaazi & Wasserman, 1992), the investigators found a similar relationship between a history of recurrent otitis media during the first three years of life and mother's reports of more child demandingness and maternal depression, as well as less positive perceptions of their own competency as parents. It also must be noted, that both of these studies (Casey, 1983; Forgays, Hasaazi & Wasserman, 1992), as well as a number or other early studies on ROM, consistently have failed to utilize observational data to directly assess child behavior, parent behavior, or parent-child interactions. Rather, a majority of the studies have relied solely upon parental reports of child behavior problems as indicators of child adjustment.

Only recently have investigators begun to expand the scope of their studies to include assessments of the relationship between recurrent otitis media and parent-child interactions (Black et al., 1988; Black & Sonnenschein, 1993; Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Freeark et al., 1992; Roberts et al., 1995; Wallace, Gravel, Schwartz & Ruben, 1996). In one study, Black et al. (1988) found that mothers of the one to two year old children with histories of otitis media that they studied were less warm and sociable when interacting with their young children. Freeark et al. (1992) examined

the impact of recurrent otitis media on children's verbal abilities and the findings indicate that parental verbal stimulation appeared to moderate the effects of otitis media on language development in a sample of three to four year old children.

Similarly, Wallace et al (1996) investigated the association between early otitis media, style of parent interaction behavior and children's language development. The results of the study suggest that high maternal verbal stimulation was associated with better language skills, whereas high levels of observed maternal control behavior during a laboratory interaction task was associated with low scores on measures of expressive language development. It should be noted that maternal control was defined in this study as a combination of several different types of both positive and negative control behaviors, including regulatory language, language seeking, information language, nonjudgmental language, and judgmental language.

In a related prospective longitudinal study of 61 infants, Roberts et al. (1995) found an association between otitis media and subsequent hearing loss, language and cognitive outcomes, but only when parenting style and quality of the home environments were taken into account. This latter study supported a multifactorial model of development within the context of exposure to early otitis media, and in combination with the other studies cited, underscores the importance of including such family factors as parent interaction style, among others, in future studies examining the impact of otitis media on children's development. These recent studies also emphasize the likely transactional nature of the relationship between early histories of recurrent otitis media and the quality of parenting behaviors and/or the home environment, as critical determinants of children's subsequent cognitive, language and socioemotional

development.

Socialization influences.

For children, the first three years of life are a time of rapid growth and development. During these early years, development becomes increasingly influenced by complex interactions with adults and other children. It also is during the second and third years of life that children become more autonomous as they move through the separation-individuation process (Erikson, 1963). With significant advancements in locomotive and cognitive abilities, children at this stage begin to consolidate their distinct sense of separateness from their parents and organize their self-identity and self-concept (Mahler, Pine, & Bergman, 1975). However, as children move toward greater independence, there also are increasing socialization demands that are placed upon the parents.

Dubin and Dubin (1963) have referred to the time between birth and six years of age as the "authority inception period". Throughout this period, one of the major tasks for parents is to prepare children for appropriate involvement in social relationships outside the home. Similarly, Baumrind (1975) has asserted that the early socialization process is a time in which the child, "through education, training, and imitation, acquires his culture as well as the habits and values congruent with adaptation to that culture" (1975, p.2).

The child's preparation for appropriate participation in social relationships is accomplished primarily through the imposition of parental authority. Parents must provide a sufficient amount of structure to allow the child to experience and develop an enduring perception of the range of acceptable behaviors. However, parents are also confronted with a difficult challenge of balancing the need for the child's conformity to external

standards with the simultaneous need for the encouragement and development of the child's autonomous behavior (Dubin & Dubin, 1963). This apparent conflict is resolved as the child consistently experiences parentally imposed boundaries, within which he/she is able to freely express his/her individuality.

Once a child is able to understand and conform to parentally imposed standards of normative behavior, the next task of socialization is for the child to begin to assume responsibility for the self-regulation of his or her own behavior (Kopp, 1987). This self-regulation is assumed to follow directly from the structure and organization that the parents have previously provided, as well as the child's own increasing ability to use language and representational imitation to reproduce the appropriate responses that are expected by his/her parents (Bandura, 1971).

Vygotsky (1962) asserted that the critical factor responsible for the development of self-regulatory behavior is the internalization of speech. In normal children, the development of self-regulatory behavior is believed to occur in three-stages (Luria, 1961, 1969). At the first stage of development, the child's behaviors are brought under the overt control of external agents, primarily the parents. At this stage the initiation and/or inhibition of behavior is clearly controlled by the parent's speech and related actions. In the second stage of development, around three to four years of age, parents continue to provide the necessary demands, restrictions, and predictable contingencies for the child's behavior, but the child begins to internalize parental standards as his/her own and starts to control his/her own behavior with the use of overt speech. This often is seen when a toddler "talks to him/herself" while playing. In the final stage, which occurs around 5-6 years of age, the child begins to utilize internal speech to control his/her own behavior.

With further increases in age, there are corresponding increases in the use of internalized speech as a primary means of controlling one's own behavior.

Baumrind (1983, 1988) has argued that the development of children's self-regulation occurs when the social control by parents is consistent and direct. Additionally, it has been suggested that children's identification with their parents further fosters the development of self-regulatory behavior (Steinmetz, 1979). Within the context of a strong affectional relationship between a parent and child, the child's imitation of parental behaviors or the perception of the similarity between him/herself and the parent will itself become intrinsically rewarding (MacDonald, 1992 Sears, Maccoby, & Levin, 1957). Through such identification with the parent, the child is then able to adopt the parental standards for appropriate behavior as his/her own. Thus, the development of a child's self-regulatory behavior is both a function of the structure and contingencies provided by the parents, as well as the child's identification with nurturing parents.

In summarizing the crucial role that parents play in the socialization of their young children, Kochanska, Kuczynski, Radke-Yarrow, & Welsh (1987) asserted that parents "must preserve their ability to effectively control their children's behavior, but they must also adopt strategies that support their children's developing autonomy" (1987, p.442). In order to understand the specific mechanisms that allow parents to effectively balance the control of their child's behavior with the support of their increasing independence and strivings for control of their own behavior, we must first examine the various models of parenting that have been proposed.

Dimensions of parenting

Symonds (1939) first argued that the early socialization process largely is determined by the multiplicative effects of two dimensions of parenting: acceptance-rejection and dominance-submission. He argued that the two dimensional space created by these dimensions could describe most styles of parenting. Other researchers have since proposed similar dimensions and/or models of parenting.

Schaefer's (1959) circumplex model of maternal behavior was based on the dimensions of autonomy versus control and love versus hostility. Freedom granting, detachment, uninvolvement, and democratic behavior were placed toward one end of the autonomy versus control axis, while possessiveness, authoritarianism, and overprotectiveness were located toward the control end of the continuum. Along the love versus hostility axis, acceptance, indulgence, and cooperation reflected maternal love, whereas rejection, neglect, and antagonistic demands indicated hostility.

A three-dimensional model containing an affective dimension (warmth-hostility), a control dimension (permissiveness-restrictiveness) and an intensity dimension (anxious involvement-calm detachment) was described by Becker (1964). The affective dimension was anchored on the warmth end by such behaviors as affection, approval, frequent explanations, positive responses to dependency behavior, use of reasoning, and praise, while the hostility end of the continuum was defined by the opposite behaviors. Restrictiveness included placing many restrictions on the child and strictly enforcing demands in most areas of daily functioning, whereas permissiveness was defined by few restrictions and lax enforcement of demands. The third dimension, anxious emotional involvement versus calm-detachment was described on the anxious emotional involvement

end by high emotionality directed toward the child, overprotectiveness, babying, and concern for the child's welfare, while the calm-detachment end was defined by the opposite behaviors.

Subsequent work by Schaefer (1965) yielded a three-dimensional model of parental behavior that was based on children's reports of parent behavior. The three dimensions that emerged were acceptance versus rejection (formerly love versus hostility), psychological control versus psychological autonomy, and firm control versus lax control. The variables that defined the positive end of the acceptance versus rejection dimension included positive evaluation, sharing, expression of affection, and equalitarian treatment. The rejection end was defined by ignoring, rejection, and neglect. Psychological control was described by intrusiveness, possessiveness, protectiveness, parental direction, and control through the use of guilt, whereas psychological autonomy was defined by extreme autonomy. This dimension was assumed to measure "covert, psychological methods of controlling the child's activities and behaviors that would not permit the child to develop as an individual apart from the parent" (1965, p. 555.). The third dimension, firm control versus lax control, was best defined by punishment and strictness on the firm control end, and lax discipline or extreme autonomy on the lax control side of the dimension. This third dimension was argued to measure the extent to which parents establish rules, set limits, and enforce the rules and limits.

Similarly, Roe and Siegelman (1963) outlined three dimensions of parental behavior: loving-rejecting, casual-demanding and overt attention. These three dimensions were somewhat related to Schaefer's (1965) three dimensions of parental behavior, although they were not conceptualized within a three-dimensional circumplex model.

Rather, Roe and Siegelman argued for the importance of each dimension, separately.

Finally, Schutz (1966) put forward a different three-dimensional model that included (1) an affective dimension, (2) a dominance dimension (control), and (3) an inclusion dimension. The affective dimension was represented on the positive end by approval, affection, and acceptance, and on the negative end by discouragement, disapproval, rejection, and blame. The positive end of the control dimension was described by those parental behaviors which reflected the promotion of independence in the absence of unreasonable control. The other end of the control dimension was comprised of such behaviors as restrictiveness, demands for obedience, coercive suggestions, and numerous rules for appropriate child behavior. Inclusion ranged from child-centeredness, parental concern for the child, indulgence, and frequent and/or intense contact on the positive end of the dimension to neglect, understimulation, ignoring, and reduced interactions on the negative end.

Central to the various models of parenting that have been proposed are the two dimensions of parental warmth-hostility and parental control. The dimension of parental warmth-hostility generally refers to a cluster of behaviors that contain a strong affective component, indicating either approval or disapproval of the child's behavior and the degree of emotional responsiveness to the child. Examples of behaviors reflecting parental warmth would include smiles, praise, approval, encouragement, physical affection, and responsiveness to the child's needs (Straus & Tallman, 1971). Hostility would be manifested by such behaviors as criticism, sarcasm, disapproval, and harsh punishment. The dimension of parental warmth-hostility is operationally defined as the summation of the frequencies of the above behaviors, with behaviors reflecting parental hostility coded

in the negative direction (Rollins & Thomas, 1979).

The second dimension of parenting behavior, parental control, often refers to those behaviors which reflect the parent's efforts to influence or otherwise exert control over the behavior of their children. In one review of the parenting literature, Maccoby and Martin (1983) identified two major types of control attempts that have been delineated: power-assertive discipline and "love-oriented" discipline. Power-assertive control techniques included physical punishment, yelling, shouting, forceful commands, and threats, many which were accompanied by strong negative affect or hostility. On the other hand, love-oriented control behaviors consisted of showing disappointment, isolation, withdrawal of love, praise, reasoning, and the contingent provision of affection. The most problematic aspect of Maccoby and Martin's (1983) model is that it does not effectively address which category would encompass the set of clearly stated parental directives that do not contain a strong negative affect component. Rather, this category of clear parental directives, that is well espoused within the parent-training literature (e.g., Eyberg & Robinson, 1982; Forehand & McMahon, 1981; Hanf & Kling, 1973; Patterson, 1975), appears to have been combined with those parental control techniques that contain a significant amount of negative affect, such as hostility.

In another review article, Steinmetz (1979) divided parental control attempts into three distinct types: love-oriented positive, love-oriented negative, and power-assertive techniques. The love-oriented positive behaviors consisted of induction, praise, reasoning, compromise, and mediation. Expressing disappointment, shaming, ridicule, isolating the child, and the withdrawal of love fell in the love-oriented negative category. The last type of parental control, power-assertive techniques, included yelling, shouting, physical

punishment, threats, deprivation of privileges, forceful commands, and tangible rewards. As was seen with the Maccoby and Martin (1983) conceptualization of parental control techniques, Steinmetz (1979) also appears to have allowed the dimension of parental control to be severely confounded by the separate domain of warmth-hostility.

Finally, Rollins and Thomas (1979) concluded that the different types of parental control attempts that have been investigated could best be separated into the categories of induction, coercion, and love withdrawal. Inductive control attempts included such behaviors as reasoning, which were used in an effort to influence the behavior of the child without engaging in a confrontation. On the other hand, coercive parental behaviors included threats, utilization of force, physical punishment, and withdrawal of material objects or privileges. The last category, love withdrawal, consisted of parental rejection, ignoring, isolating, disapproving, or other similar behaviors that would indicate disappointment with the child's behavior. Both Rollins and Thomas (1979) and Steinmetz (1979) appear to infer that the qualities of negotiation and/or avoidance of conflict are essential aspects of those parental control techniques that fall within the "love-oriented positive" or "inductive" control categories. As was also seen with Maccoby & Martin's model (1983) and Steinmetz's model (1979), clearly stated parental directives (without a strong negative affective component) do not appear to be accounted for in Rollins and Thomas's (1979) description of types of parental control behaviors.

Despite the similarities in the way parental control attempts have been conceptualized across studies, there are a variety of differences that have been somewhat problematic, such as the confounding of different types of control attempts with the dimension of warmth/hostility and the failure to differentiate between positive and

negative control techniques. A further detailed discussion of the problems that have been encountered in the definition of the parental control dimension will be presented later. First, I will turn to research examining the joint effects of parental warmth and control.

Research examining dimensions of parenting

It was the influential work of Diana Baumrind (1967, 1968, 1971, 1988) that firmly established the importance of the two dimensions of parental warmth and control. Baumrind (1971, 1988) was interested in determining the parental antecedents of competence in preschool-aged children. In her research, she found that parents who displayed a pattern of firm control in combination with high parental responsiveness or warmth tended to have children who were securely attached, altruistic, independent, obedient, and high in self-esteem. This pattern of parental behavior has subsequently been labeled "authoritative parenting" (Baumrind, 1967, 1988).

The authoritative parent was described as a parent who attempts "to direct the child's activities but in a rational, issue-oriented manner. She (sic) encourages verbal give and take, and shares with the child the reasoning behind her policy. She values both expressive and instrumental attributes, both autonomous self-will and disciplined conformity. Therefore, she exerts firm control at points of parent-child divergence, but does not hem the child in with restrictions. She recognizes her own special rights as an adult, but also the child's individual interests and special ways. The authoritative parent affirms the child's present qualities, but also sets standards for future conduct. She uses reason as well as power to achieve her objectives. She does not base her decisions on group consensus or the individual child's desires; but also does not regard herself as infallible or divinely inspired" (Baumrind, 1968, p.261).

In contrast to the authoritative style of parenting, two other styles, "authoritarian" and "permissive" parenting, were not as strongly related to the development of competence in preschool age children (Baumrind, 1971). Authoritarian parents were described as more demanding, controlling, rigid, and punitive, as well as less accepting of, and responsive to, the needs and interests of the child, than were authoritative parents. On the other extreme, permissive parents were unable or unwilling to provide the necessary structure, make appropriate demands, or communicate the expectancies for mature behavior on the part of the child. Thus, Baumrind (1983, 1988) argued that one of the most effective styles of parenting balanced the need for firm control with the provision of warmth and support to encourage the development of the child's independence and self-regulatory behavior.

Subsequent studies have generally supported Baumrind's findings. Stayton, Hogan, & Ainsworth (1971) found that early maternal responsiveness and sensitivity to children's needs were inversely related to the subsequent emergence of such behaviors as crying and/or noncompliance to maternal commands. It was also found that neither the frequency of verbal commands nor the frequency of discipline-oriented physical interventions, by themselves, were correlated with child compliance. These findings suggest that a balance between parental warmth and control is a more important determinant of child compliance than either one alone.

Lytton (1979) showed that when parental commands were combined with positive behaviors, such as smiling or praise, the effectiveness in securing compliance was greatly increased. On the other hand, commands that were combined with physical control or other aversive parental behavior (e.g., criticism), reduced the effectiveness in obtaining

compliance.

In another study, Schaffer & Crook (1980) found that a mother's responsiveness and sensitivity to her child's immediate attentional state significantly influenced whether or not her requests were successful in obtaining compliance. Similarly, the degree to which parents were able to follow their child's attentional state and synchronize their attempts to direct or control the child's behavior predicted subsequent compliance to parental control attempts (Rocisano, Slade, & Lynch, 1987).

More recent studies have provided additional evidence supporting the importance of the role that both parental warmth and control play in early childhood socialization (e.g., Lay, Waters & Park, 1989; Lemanek, Stone & Fishel, 1993; Rothbaum, Rosen, Pott & Beatty, 1995; Wakschlag & Hans, 1997). For example, Lay, Waters & Park (1989) found that maternal responsiveness was associated with increased child compliance in a sample of four year old children. In another study, Lemanek, Stone & Fishel (1993) found that preschool age children's compliance was associated with parents use of both instructions and cues, as well as reinforcement, whereas noncompliance was associated with the parent's use of structure and verbal/nonverbal attention-getting behaviors, in the absence of reinforcement behaviors. In yet another recent study, Wakschlag & Hans (1997) found a link between low maternal responsiveness in infancy and the subsequent development of disruptive behavior disorders in a sample of high risk children prenatally exposed to opioids.

In summarizing the research on the dimensions of parenting, Martin (1987) concluded that "the processes involved in warmth and control are most profitably viewed in interactive terms. Harmonious interactions between parent and child are more likely to

result when parental control efforts are sensitive to and moderated by the infant's or child's state, in other words, when accompanied by many of the qualities summarized as warmth" (1987, p. 183).

Thus, it is the clearly communicated control attempts that explicate the parental wishes for children's behavior. Then, through repeated compliance to parental directives, the child is able to observe him/herself behaving in accordance to parental standards, and eventually internalizes these standards of appropriate behavior as their own. However, both the immediate attainment of compliance and the subsequent internalization of such standards for appropriate behavior are maximized when the control attempts occur within the context of a responsive, supportive, and nurturant relationship (Baumrind, 1983, 1988; Maccoby, 1983, 1992; Maccoby & Martin, 1983).

When such a balance of warmth and control occurs it suggests that the child is respected as an individual and the parent actively seeks to establish a legitimate base of power without compromising the autonomous development of the child. Within the context of the comfort and safety experienced in the presence of the parent, the child is subsequently able to freely explore and experience new aspects of his/her environment, including other social relationships.

Both Maccoby (1983, 1992; Maccoby & Martin, 1983) and Kochanska (1997) have argued that the socialization process involves inducting the child into a reciprocal orientation or system of reciprocity, in which the development of a mutually responsive relationship between parent and child, over time, results in a decreased need for parental control behaviors. Thus, it is through the development of this mutually responsive relationship that children gradually internalize their parent's goals and values, thereby

reducing the need for parental coercion or control.

Limitations of Socialization Literature

Parental Control: One of the major limitations of the socialization literature has been the various ways that parental control attempts have been defined, particularly "coercive" control attempts. Too often, researchers have combined ineffective negative control techniques, such as punishment, yelling, threats, vague directives, and deprivation of privileges, together with more effective power-assertive control behaviors, namely, clearly stated commands and directives (see Maccoby & Martin, 1983, Rollins & Thomas, 1979, Steinmetz, 1979). However, there is an important distinction between these two types of control attempts (Darling & Steinberg, 1993; Lee & Bates, 1985; Smetana, 1994).

The first group of behaviors often reflect parental punitiveness, coerciveness, and hostility and can be viewed as "functionally superfluous" control methods (Lepper, 1981; Maccoby & Martin, 1983). On the other hand, parental commands and directives represent consistent discipline techniques often used to effectively influence children's behavior (e.g., Forehand & McMahon, 1981; Patterson, 1982; Smetana, 1994). Although the category of parental commands often ranges from subtle suggestions to forceful directives, it nevertheless remains important to distinguish between clear parental directives and the more ineffective, punitive, or hostile control attempts.

Within the socialization literature, few researchers (e.g., Baumrind, 1971, 1988; Darling & Steinberg, 1993; Lee & Bates, 1985; Maccoby & Martin, 1983; Smetana, 1994) appear to have made the clear distinction between more positive and more negative types of parental control techniques. For example, Lee & Bates (1985) separated parental

control into a "positive control" factor and a "negative control" factor. The positive control factor included suggesting, giving choices, and giving incentives for compliance, whereas the negative control factor consisted of prohibiting, scolding, repeated prohibiting, physical punishment, removing or restraining the child, and removing objects.

Upon examining those parental control attempts that typically have been considered inductive control methods, it is clear that these statements often consist of a clearly stated directive followed by explanations, reasons, or other statements that are assumed to increase the probability of both compliance and subsequent internalization of the particular parental standard. Therefore, it appears more useful to conceptualize directive control attempts as falling within the dimension of inductive or "positive" parental behaviors.

Baumrind (1971, 1988), in defining the dimension of "firm control", clearly distinguished between appropriate or positive control techniques and negative control behaviors. Firm control was defined as "firm enforcement of rules, effective resistance to the child's coercive demands, and willingness to guide the child by regime and structured interventions. It does not imply many rules or intrusive directiveness of the child's activities" (Baumrind, 1971, p.98). Thus, firm control was distinguished from other parental control attempts, such as punitiveness or unqualified power assertion, that might be used to overprotect or over-restrict the child's behavior. In fact, Baumrind (1983, 1988) later contended that although authoritative parents were high in firm control they were also low in the use of negative control techniques, such as unqualified power assertion and punitiveness.

The importance of distinguishing between "positive" control techniques and those punitive or coercive techniques which are less effective in obtaining compliance is further highlighted by Bell & Harper's (1977) theory of upper and lower limit controls and Lepper's (1981) notion of the "minimally sufficient pressure". According to Bell & Harper's (1977) homeostatic control theory of interaction, parents will attempt to maintain a certain level of contact and control within a given interactional situation with their child. If the level of interactive behavior moves outside the permissible range, either too high or too low, the parent then will employ upper- or lower-limit control techniques to restore the interaction to more desirable levels.

Lower-limit controls are used to increase the level of the child's interactive behavior. For example, if a child is withdrawn, inactive, inhibited, or otherwise performing at a level below what previously has been established as a baseline, a parent likely would attempt to stimulate the child's behavior through the use of praise, requests, suggestions, drawing attention to stimuli, helping, or other similar behaviors. Conversely, upper-limit controls such as disapproval, distraction, prohibitions, and physical control or punishment are utilized to reduce the amount of inappropriate or excessive behavior.

Extrapolating from Bell and Harper's (1977) theory, an argument can be made that the group of upper-limit control behaviors more accurately reflects the coerciveness and punitiveness typically attributed to the "functionally superfluous" categories of parental control techniques, which also is consistent with Patterson's (1982) theory of coercive family processes. Although many parents will inevitability use upper-limit control behaviors, depending upon the demands of the situation, those parents who are less skilled in using more directive control attempts would be expected to resort to upper-limit

control methods more frequently.

In spite of the general utility of a homeostatic theory for explaining parental control efforts with children's behavior that clearly falls outside of the range of normal interactive behavior, it does not adequately address interactions that fall at different points within the acceptable range of normal interactive behavior. For example, the theory does not explain why a parent might allow their child to engage in mildly disruptive behavior in one setting, yet place some minor restrictions on the child's behavior in another setting, particularly if the only difference between the two situations was the type of setting and not whether the child's behavior actually exceeded an objective threshold of parental tolerance. Therefore, it would be useful to examine the effectiveness of other parental control attempts that are utilized when the child's behavior falls within the range of acceptable behavior.

Lepper (1981) suggested that the most effective socialization (internalization of parental standards) occurs when parents utilize the least amount of control necessary to obtain compliance. Therefore, within the range of acceptable child behavior, the most effective parents would be expected to utilize more subtle control methods, such as induction, reasoning, and clear commands. This position also is consistent with the more recently advanced notion, mentioned earlier, that the socialization process involves inducting the child into a reciprocal orientation or system of reciprocity, in which the development of a mutually responsive relationship between parent and child over time results in a decreased need for parental control behaviors (Kochanska, 1997; Maccoby, 1983, 1992; Maccoby & Martin, 1983).

In summary, one of the major limitations of the socialization literature has been the failure to differentiate between punitive or coercive parental control attempts and more positive or inductive control attempts. "Negative" parental control attempts are best described by behaviors such as vague commands, no-opportunity commands, threats, yelling, shouting, prohibitions, and physical restraint or punishment.

The group of parental behaviors that reflects high "positive" control includes making clear demands or requests of the child, asking directive questions, and setting clear and consistent contingencies for the child's behavior. On the other hand, low positive parental control or permissiveness would be represented by few parental directives and lax or inconsistent enforcement of rules.

Developmental Variations: A second limitation of the socialization literature has been the tendency for researchers to ignore important developmental variations and expectations with respect to child and parental behavior. First, many reviews of the literature have attempted to generalize findings across a wide range of ages (Maccoby & Martin, 1983; Rollins & Thomas, 1979; Steinmetz, 1979). Second, the conclusions that have been reached by these reviewers typically have assumed that the especially effective parenting conditions at one age will be equally effective at many other ages. Until recently, the distinction that has received the most attention has been the differences in parenting for young children and adolescents. Few researchers have examined parenting differences that take into account developmental differences occurring within the preschool years alone.

Only recently have researchers attempted to take a more developmental perspective when investigating parental socialization efforts with preschool-aged children

(e.g., Baumrind, 1983, 1988; Dubin & Dubin, 1963; Kochanska, 1997; Kochanska et al., 1987; Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987; Lay, Waters & Park, 1989; Lemanek, Stone & Fishel, 1993; Maccoby & Martin, 1983; Rothbaum, Rosen, Pott & Beatty, 1995; Smetana, 1994; Vaughn, Kopp, & Krakow, 1984; Waschlag & Hans, 1997). The most important developmental consideration is that younger children necessarily require more control and directiveness than older children (Kochanska, 1997; Kuczynski et al., 1987). As noted before, parents must initially provide a sufficient amount of structure to allow young children to experience and develop an enduring perception of the range of parentally acceptable behaviors. Once a foundation has been established, parents then are able to gradually relax the amount of control that is necessary to regulate their child's behavior (Kochanska, 1997; Maccoby, 1983, 1992; Maccoby & Martin, 1983). However, it remains that "parents typically confront children with rules, sanctions, and norms long before the children are capable of cognitively appraising their legitimacy or validity." (Baumrind, 1983, p.139).

Over time, as children begin to internalize parental standards of appropriate behavior and regulate their own behavior, parents develop greater expectations for compliant behavior (Kochanska, 1997; Kopp, 1982). As expected, increases in compliance to maternal control attempts have been found to be age-related, even among children between one to four years of age (Kopp, 1982; Schaffer & Crook, 1980; Kochanska, 1997; Kochanska et al., 1987; Maccoby, 1992; Vaughn et al., 1984). Similarly, parental control strategies have been shown to be age related, as well. In one study examining developmental differences in maternal control strategies among children between 15 and 44 months of age, parents of the older children were observed to utilize

fewer physical control methods and more indirect verbal strategies than did the parents of the younger children, including more maternal explanations, bargaining, and reprimands (Kuczynski et al., 1987). It was suggested by the researchers that the parents were attempting to match their control techniques to the developmental level of the child, with more direct control methods being necessary for younger children.

If the shift from direct to indirect control methods occurs at too early of an age, negative consequences may occur. For example, Hatfield, Ferguson, and Alpert (1967) and Yarrow, Campbell, and Burton, (1968) both found that the use of indirect control techniques such as reasoning were positively associated with the aggressive behavior of preschool-aged boys in the home. Thus, parents need to carefully match their parenting style with the child's developmental level, being careful not to provide the child with too much latitude too quickly. When the child is young (under three years of age), parents necessarily tend to utilize more direct control attempts to clearly establish the boundaries of acceptable behavior for the child, and lay a foundation for the development of the child's self-regulatory mechanisms. Later, around the age of three to four years, as the child gradually internalizes the parental standards of behavior and develops greater self-regulatory behavior, the parent can begin to adopt a less directive stance toward controlling the child (Kochanska, 1997; Maccoby, 1983, 1992; Maccoby & Martin, 1983; Smetana, 1994). Therefore, within the present study, it was expected that parents, in general, would exhibit an even balance between direct and indirect control behaviors, as appropriate for children between three to four years of age.

Nonclinical Populations: A final limitation of the socialization literature has been the primary focus on nonclinical populations. Much of the developmental research has

been directed towards the examination of the socialization process, under normal circumstances. However, there are certain stressors, such as childhood illness, which may impinge upon this socialization process by disrupting the normal maturation and/or attainment of important developmental milestones (Cerreto, 1986). Furthermore, such a disruption to the child's socialization most likely would occur if the stressor directly impacts upon the child's temperament, indirectly influences the child's interactions with their parent(s), and/or indirectly has an impact upon the parent's perceptions, attitudes, and/or behavior directed towards the child . Therefore, it is essential to consider the temperamental state or clinical status of the child, as well as the potential immediate and long-term effects these conditions may have on the child's behavior, the parent's behavior, and the parent-child interactional system.

The concept of temperament typically has been defined as a constitutionally determined behavioral style that is somewhat stable over time (Goldsmith & Campos, 1982; Rothbart & Derryberry, 1981). One of the most widely cited theories of infant temperament originally was proposed by Thomas, Chess, Birch, Hertzig, & Korn (1963). They argued that there are nine separate dimensions that constitute the notion of temperament. The dimensions are: activity level, approach/withdrawl, regularity, adaptibility, threshold, intensity, mood, distractibility, and attention span. From these nine dimensions, Thomas et al. (1963) derived three distinct typological classifications of infant temperament: "easy", "difficult", and "slow-to-warm-up". Other researchers since have proposed similar theories of infant temperament (e.g., Buss & Plomin, 1975, Rothbart & Derryberry, 1981; Brazelton, 1973).

Bates (1980) concluded that the most essential qualitative component of a "difficult temperament" was the parent's perception of the infant's frequency and intensity of negative affect. Similarly, it has been argued that, over an extended period of time, a child with a "difficult" temperament gradually may become an aversive stimulus for a parent, through the process of conditioning (Lamb, 1978). Such conditioning, subsequently might lead the parent to become less warm, responsive, and sensitive to the child's needs, thereby placing the child in a more vulnerable position (Donovan, Leavitt, & Balling, 1978). This process might also be expected to result in the emergence of coercive parent-child interactions and/or child behavioral difficulties (Patterson, 1982).

With respect to its impact on styles of parenting, maternal reports of early difficult temperament (age 6-13 months) has been shown to be positively correlated with later observations of resistance to maternal control attempts and parental use of power assertion at 24 months (Lee & Bates, 1985). Children, rated by their mothers as "temperamentally difficult" when they were between 6 and 13 months of age, were more likely to approach breaking an established rule or damage something within the home at 24 months of age, than were "temperamentally easy" children. In response to their children's behavior, mothers of the "difficult" children, compared to mothers of "easy" children, were more likely to use intrusive control tactics, which were resisted more often by the "difficult" children. These findings provide evidence that a child with a difficult temperament in infancy may elicit negative parental behavior and may also be at risk for the subsequent development of interactional difficulties and/or behavioral problems.

In another study, maternal reports of "difficult" temperaments in their children were positively related to both maternally reported behavior problems and observed

negative interactions between mothers and their three to five year-old children (Webster-Stratton & Eyberg, 1982). More specifically, the children described by their mothers as active and inattentive were observed to respond to their mothers in a more negative, nonaccepting, and noncompliant manner than normal children responded to their mothers. Similarly, mothers who rated their children as temperamentally "difficult", when compared to mothers who rated their children as "temperamentally compatible", were more negative in affect, nonacceptance, and submissiveness. However, the findings from this study must be interpreted cautiously as the families had been recruited to participate in a parent training program designed to help parents manage child misbehavior, which may have influenced the mother's response biases as well as their interactions with their children. Additionally, the ratings of temperament and behavior problems were both based on maternal reports which only were taken at the time of the study, rather than at an earlier age. Nevertheless, these results are consistent with other studies reviewed, indicating that children with difficult temperaments may exhibit more behavior problems, respond more negatively and noncompliantly towards their mothers, and may elicit more negative behaviors from their mothers, than normal children.

The powerful effects that a child's characteristics and behavior can have on parent's behavior is further illustrated by the work of Humphries, Kinsbourne, & Swanson (1978) and Barkley & Cunningham (1979) with hyperactive children and their mothers. Using a double-blind, drug-placebo crossover design, Humphries, Kinsbourne, & Swanson (1978) examined the effects of methylphenidate on mother-child interactions during a structured task situation in a clinic playroom setting. In the medication condition, compared to the placebo condition, the hyperactive children exhibited increases in their verbal directions

given to their mothers and decreases in the amount of critical or negative statements. Similarly, the mothers showed decreases in their directiveness, decreases in their criticisms, and increases in their praise in the medication condition, compared to the placebo condition.

Barkley and Cunningham (1979) used a similar triple-blind, drug-placebo crossover design to examine changes in mother-child interactions, attributable to methylphenidate administration. When the hyperactive children were given methylphenidate, there were significant increases in the children's sustained attention and compliance to maternal commands and a decrease in the amount of off-task behavior, when compared to interactions during a placebo condition. In response, the mothers displayed a significant decrease in the number of commands and negative responses, and an increase in the amount of attention, praise, and other positive responses to the children's increased compliance during the medication trials. The results of both studies indicate that when hyperactive children were receiving medication, their behavior was perceived by their mothers as more acceptable and thus did not require as much control as when they were given a placebo. Additionally, the mothers of hyperactive children were able to increase the amount of contingent postive responding when the children displayed more appropriate behavior, following the administration of the methylphenidate. Overall, these findings indicate that children can have a significant negative impact upon the quality of parent-child interactions, by exhibiting deviant and noncompliant behavior, as well as by eliciting certain types of behavior from their parents, but that this impact can be changed through interventions with the child.

Sameroff and Chandler's (1975) transactional model of development provides another useful way of understanding how children's temperamental states can influence expressed styles of parenting, as well as how parenting behaviors can have a significant impact upon children's behavioral adjustment and their overall emotional development. According to their model, developmental outcomes are determined by the continuous dynamic interaction between child characteristics and environmental context (parenting), over time. That is, at any given point in time, a child's developmental competency is a result of the interaction between the effect of the child on the parents and the subsequent effect of the parents on the child. The previously reviewed literature on the effects of children's temperament upon parent's behavior illustrated the powerful direction of influence from children to their parents. On the other hand, the socialization literature that was reviewed (and the literature on specific clinical populations that will be reviewed later) revealed the means by which parent's behaviors have a direct impact upon children's behavioral and emotional adjustment.

Utilizing Sameroff and Chandler's (1975) transactional model, one can appreciate the potential deleterious, synergistic effects that might occur when a child with a difficult temperament is exposed to an ineffective style of parenting, especially over time. The resulting cycle of dysfunctional interactions is similar to Patterson's model of coercive family interactions (Patterson, 1982). According to Patterson's theory of coercive family interaction, once a pattern of dysfunctional interactions is initiated the likelihood of further escalation is greatly increased due to the creation of a self-reinforcing negative feedback loop of dysfunctional behaviors. Thus, it becomes clear that a difficult temperament and/or an ineffective style of parenting can independently contribute to the development of

child behavioral difficulties and dysfunctional parent-child interactions, over an extended period of time. However, if both situations exist, there will be a significantly greater risk for the development of child behavioral difficulties and dysfunctional parent-child interactions, because the negative effect of a child's difficult temperament will tend to interact synergistically with the negative effect of an ineffective style of parenting.

In summary, the major limitations of the socialization literature have included (1) combining positive parental control behavior with more punitive or coercive control techniques to form a broad dimension of parental control, which then may be confounded with the dimension of parental warmth/hostility, (2) ignoring important developmental variations when considering early childhood socialization, and (3) the relative lack of attention directed towards examining the potential effects of a difficult temperament on parent behavior and parent-child interactions. Given these limitations, it would be useful to examine the clinical literature to explore the potential effects that child stressors may place upon the parent-child relationship.

Research on Clinical Populations. Various populations of clinic-referred children and their parents have been studied to better understand how specific child behavior elicits various parenting behaviors, and vice versa. Several of the more extensively studied populations include conduct-disordered, hyperactive, and abused and/or neglected children. Observations of these children's interactions with their parents have consistently revealed a pattern of dysfunctional parent-child interactions, which can be extended to other groups of children with related characteristics.

Conduct-disordered children often have been described as displaying high rates of aggressive, destructive, disobedient, manipulative, and other aversive behaviors (e.g.,

Bernal, Duryee, Pruett, & Burns, 1968; O'Leary, O'Leary, & Becker, 1967; Patterson, 1974; Peed, Forehand, & Roberts, 1977). Estimates indicate that conduct-disordered children comprise 1/3 to 1/2 of the total number of children referred for child behavior problems (Patterson, Reid, Jones, & Conger, 1975). Thus, this group of children represents a substantial portion of the children treated in clinics each year.

In families with antisocial children, studies generally have found a greater frequency of aversive interactions by both parents and children (e.g., Delfini, Bernal, & Rosen, 1976; Johnson & Lobitz, 1974; Lobitz & Johnson, 1975; Patterson, 1976; Snyder, 1977; Wahler, Hughey, & Gordon, 1981). In one study, clinic-referred children displayed more deviant behavior, while their parents displayed more commands and negative behaviors, as compared to normal children and their parents (Lobitz & Johnson, 1975). Other studies also have shown that conduct-disordered children are more deviant and noncompliant than normal children (Delfini, Bernal, & Rosen, 1976; Forehand, King, Reid, & Yoder, 1975; Griest, Forehand, McMahon, & Wells, 1980). Similarly, parents of children with conduct disorders generally are more controlling, negative, and critical than parents of normal children (Forehand, King, Peed, & Yoder, 1975; Green, Forehand, & McMahon, 1979; Terdel, Jackson, & Garner, 1976).

Within the hyperactive population, mothers have been observed to be more critical, directive, and controlling, yet less positive than mothers of normal children (Campbell, 1973; Campbell, 1975; Cohen, Sullivan, Minde, Novak, & Keens, 1983; Cunningham & Barkley, 1979). In one study, the mothers of hyperactive children were more negative, more directive, asked fewer questions, gave less praise, and initiated fewer interactions during a structured task situation, than mothers of control children. At the same time, the

hyperactive children themselves were less compliant and responsive to parental behaviors (Mash & Johnston, 1982). Similarly, Cunningham & Barkley (1979) found a greater number of parental commands and negative responses, and fewer positive responses to the social interactions, quiet play, and cooperative behavior of hyperactive children.

Within the third illustrative population of children, a sample of abusive and neglectful mothers were shown to emit fewer positive behaviors (approval and support) and more control attempts, disapproval, and rejection, as compared to non-abusive mothers (Burgess & Conger, 1978). The abused and neglected children showed comparably higher rates of aversive behaviors than well-reared children. Other researchers have found similar levels of aversive behaviors in abusive families (Boshua & Twentyman, 1984; Reid, Taplin, & Lorber, 1981).

In summary, the findings from observational studies of conduct-disordered, hyperactive, and abused or neglected children and their parents, have yielded a general pattern of dysfunctional interactions. For the clinic-referred children, the pattern that emerged consisted of greater levels of aversive or deviant behavior and greater noncompliance to parental requests, as compared to normal children. Similarly, the parents of these children emitted more controlling, negative, and critical behaviors, as well as fewer positive or supportive behaviors, than did the parents of the comparison children.

In comparison to the pattern of effective parenting that has been outlined within the socialization literature, the parents examined above were much higher on the negative control dimension and much lower on the dimension of warmth or responsiveness, relative to parents of normal children. The extreme level of negative control attempts likely reflects control strategies similar to Bell & Harper's (1977) upper-limit controls. As the

children's behavior moved beyond the limits of the range of parentally acceptable behavior, upper-limit control behaviors were utilized by the parents to restore the interaction to more desirable levels.

At the same time, the parents of the clinic-referred children displayed less warmth or responsiveness, which likely resulted from an extended history of aversive interactions with the child. Over time, the child may have become an aversive stimulus for the parent, leading the parent to become less responsive to the child's interactions and needs (Donovan, Leavitt, & Balling, 1978; Lamb, 1978).

These dysfunctional relationships between parent and child behavior were further exacerbated by increases in the structure or situational demands of the observed interaction tasks, at least in some of the studies reviewed above (e.g., Campbell, 1975; Cohen et al. 1983; Cunningham & Barkley, 1979; Mash & Johnston; Robinson & Eyberg, 1981; Webster-Stratton, 1985). For example, Cohen et al. (1983) found a significant increase in the overall frequency of negative maternal interactions with their hyperactive children in a difficult task, as compared to an easier task situation. The observed pattern of more suggestions, prohibitions, attentional commands, and disapproving comments during an easy task was further elevated in the difficult task situation, when compared to the interactions of mothers of non-clinic referred children.

Other researchers have found corresponding increases in child deviant behavior and noncompliance to parental requests, as well as increases in parental control attempts and critical behavior in structured task situations, when compared to free-play situations (Robinson & Eyberg, 1981, Webster-Stratton, 1985). Overall, these findings indicate that parent-child interactions have the potential to become more dysfunctional as the structure

and situational demands increase, particularly if the parents are not able to balance their control attempts with warmth or responsiveness. With increases in structure or situational demands parents can become more controlling and critical, as well as less responsive. Likewise, the children can become more noncompliant and display more deviant behavior. These findings are particularly applicable to conduct-disordered, hyperactive, and abused or neglected children and their parents, yet also may apply to other populations as well.

In summary, a review of the socialization literature emphasizes that effective parenting reflects a balance between parental warmth or responsiveness and positive control. It was also argued earlier that the multiplicative effects of parental warmth and positive control are more important than either dimension alone, or the additive effects of each dimension. Furthermore, the remaining developmental literature that was reviewed underscored the importance of establishing a match between the style of parenting and the child's temperament or developmental level.

In the review of the clinical literature it was shown that there are situations where the normal socialization process has gone awry, resulting in dysfunctional parent-child interactions. Childhood illnesses are another example of how stress can directly and/or indirectly influence both a child's temperament and a parent's style of interacting with their child. As noted earlier, the research on ROM illustrated how one particular childhood illness may have such a negative impact upon parent-child interactions. Yet, this particular area of research also has several limitations.

Limitations of current research on ROM and its relationship to the current study.

One of the major limitations of the early studies on ROM was the noticeable absence of observational data on parent-child interactions. Most of the early studies relied almost

exclusively upon parental reports of parent-child interactions and the child's behavior to evaluate the child's adjustment to the illness (Casey, 1983; Hersher, 1978; Gottleib, Zinkus, & Thompson, 1979). It is clear that reliance on potentially biased data places a researcher in a precarious position with respect to the validity and generalizability of the results (Atkeson & Forehand, 1978; Hetherington & Martin, 1979; Schnelle, 1974). The importance of utilizing multiple assessment methods to evaluate both parent-child interactions and the presence and severity of behavioral problems in families has been well espoused in the literature (Aragona & Eyberg, 1981, Cantwell & Baker, 1971; Eyberg, 1985; Lobitz & Johnson, 1975; Lytton, 1974; Webster-Stratton & Eyberg, 1982).

Only recently have investigators begun to expand the scope of their studies to include assessments of the relationship between recurrent otitis media and parent-child interactions (Black et al., 1988; Black & Sonnenschein, 1993; Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Freeark et al., 1992; Roberts et al., 1995; Wallace, Gravel, Schwartz & Ruben, 1996). However, even these more recent studies have mainly focused on examining the relationship between otitis media and such outcomes as subsequent hearing loss, language and cognitive outcomes. Few, if any of the more recent studies have utilized actual observations of parent-child interactions to explore the potential impact of otitis media on children's behavioral adjustment.

Despite this limitation, the more recent studies nevertheless have provided support for a multifactorial model of development within the context of exposure to early otitis media. In combination with the other studies cited, the recent studies on otitis media underscore the importance of including such family factors as parent interaction style, among others in future studies examining the impact of otitis media on children's

development. These recent studies also emphasize the likely transactional nature of the relationship between early exposure to otitis media and the quality of parenting behaviors and/or the home environment, as critical determinants of children's subsequent cognitive, language and socioemotional development.

Regarding the scope of observational data, the review of the socialization literature emphasized the importance of examing both negative and positive parent-child interactions. Too often, the focus of a study will concentrate only on the negative interactions, while ignoring the potential contribution of positive interactions. This point was highlighted earlier, where the multiplicative effects of the dimensions of parental warmth and control have been demonstrated to be more important than the contribution made by either dimension separately. Researchers only recently have begun to emphasize the role of such positive parent-child interactions, since they are a means through which both parents and their children learn to be mutually reinforcing, cooperative, and sensitive to each other needs (Dowdney, Mrazek, Quinton, & Rutter, 1984; Gardner, 1987; Kochanska, 1997; Maccoby, 1983, 1992; Maccoby & Martin, 1983).

A second limitation, that extends beyond the existing chronic illness literature, is the surprising lack of attention to the contributions of fathers to overall family functioning. Most available studies have focused almost exclusively on mothers. Those few studies within the general chronic illness literature that have included fathers typically have found both important similarities and differences in parent's self-reported data.

For example, a study by Tavormina, Boll, Dunn, Luscomb, and Taylor (1981) found that both mothers and fathers of hearing-impaired children reported a significantly greater number of behavioral problems and behavior management concerns, when

compared to parents of asthmatic, diabetic, and cystic fibrotic children. However, despite the agreement on overall levels of reported behavior problems, mothers and fathers differed in their specific patterns of reported problem behaviors. Mothers reported more problems with aggression and overactivity for boys, whereas the fathers indicated more overactivity and sleep disturbances. Thus, it is important to examine both parent's contributions to the child's functioning and adjustment.

In order to better understand how a specific illness, such as ROM, might have an impact upon certain aspects of family functioning and vice versa, several factors must be considered. First, as described earlier, an acute episode of otitis media may predispose a child to be quite irritable and fussy, primarily due to the pain and discomfort of the actual ear infection (Bluestone et al., 1983; Forgays, Hasazi, & Wasserman, 1992; Roberts et al., 1995). Second, the effusion associated with the illness often results in a temporary, yet sometimes substantial, hearing loss (Bluestone et al., 1983; Daly, 1991; Downs, 1983; Fria, Cantekin & Eichler, 1985; Roberts et al., 1995). It may be the combination of these two factors that, over time, directly places the child at risk for exhibiting communication difficulties or a language delay (Cass & Kaplan, 1979; Friel-Patti & Finitzo, 1990; Gottleib, Zinkus, & Thompson, 1979; Lehmann, Charron, Kummer et al., 1979; Teele et al., 1990; Ventry, 1980), behavioral problems (Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Gottleib, Zinkus, & Thompson, 1979; Roberts, Burchinal & Campbell, 1994; Vernon-Feagans, Manlove & Volling, 1996), and/or indirectly places the child at risk for parent-child interactional problems (Black et al., 1988; Black & Sonnenschein, 1993; Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Freeark et al., 1992).

A parent who has a child with fluctuating hearing losses, accompanying irritability, and behavior problems may begin to perceive their child as "difficult" or temperamental. This negative perception of the child then would be exacerbated if the parent inadvertently interprets observed behavioral problems and/or noncompliance as intentional, rather than primarily due to recurrent ear infections and associated sequelae. The perception of a "difficult" child in the context of continued interactional difficulties also would be expected to contribute to an increase in the parent's frustration and a reduced sense of competency as a parent over time. In such a situation, a parent might be more likely to respond to their child in a less positive and more negative or controlling manner, further exacerbating any existing difficulties that the child is experiencing in regulating his/her behavior that may have initially originated as an indirect result of ROM.

However, as was previously noted in the review of the socialization literature, if a parent is sensitive to their child's needs, able to convey warmth, and able to synchronize their attempts to direct or control the child's behavior with the child's temperamental state, then the likelihood of obtaining compliance and maximizing the child's behavioral and emotional development should be significantly increased (Baumrind, 1983, 1988; Kochanska, 1997; Kochanska, Kuczynski, Radke-Yarrow & Welsh, 1987; Maccoby, 1983, 1992; Martin, 1987; Rocisano, Slade, & Lynch, 1987; Schaffer & Crook, 1980). The present study investigated whether more effective parenting behaviors moderate the relationship between recurrent otitis media and children's behavioral problems, among children experiencing varying early histories of ROM.

Study Hypotheses

The purpose of the present study was to assess relationships among ROM, child behavior and parent-child interactions for a group of families with children who had varying degrees of ROM during the first three years of life. It was anticipated that the quality of parent-child interactions would play a role in moderating the deleterious effects of ROM on children's behavioral functioning. Two alternative models of relationships between ROM severity during the first three years of life, style of parent interactive behavior (parental warmth and parental control), and children's behavioral adjustment at three to four years of age were tested within the context of the present study (See Figure 1).

The first model, the "independent influence" model, postulates that ROM severity and style of parent interactive behavior (parental warmth and control) independently influence children's behavioral adjustment, with ROM having a direct and indirect effect on adjustment. According to this model, recurrent otitis media in the first 3 years and parenting independently contribute to children's behavior so that children with severe histories of ROM will be better adjusted than children with similar histories if they are exposed to effective parenting behavior (both high parental warmth and positive parental control), but would not be as adjusted as children who also are exposed to effective parenting behavior but do not have early histories of ROM.

The second model, the "buffering model", argues that an effective style of parent interactive behavior buffers the deleterious effects of ROM on child behavior. Thus, those children with severe histories of ROM exposed to less effective parent interactive behavior will exhibit poor behavioral adjustment. However, children with early histories of ROM

exposed to effective parent interactive behavior will be as well adjusted as children raised in similar environments, but without severe histories of ROM.

The present study sought to determine whether style of parent interactive behavior and ROM history were independently associated with child behavior problems, as suggested in the "independent influence model" and/or whether style of parent interactive behavior would moderate the relationship between ROM and child behavior problems, as suggested by the "buffering model".

Data on both child and parent behavior were collected during a behavioral observation task that included three segments varying in structure. These tasks involved child-directed play (the least structured), parent-directed play and parent initiated clean-up (the most structured). In general, it was expected that ROM effects would be more observable, and hence, there would be greater support for one or the other hypothesis as the structure and situational demands of the observed parent-child interaction task increased. Because more structured tasks are likely to elicit more negative behavior and push for greater parental control, it was during these increasingly demanding tasks that the deleterious effects of ROM were most likely to be observed. Thus, a linear relationship was expected to exist across tasks, with more negative child and/or parent behavior occurring in (1) the parent-directed play segment compared to the child-directed play segment and (2) the clean-up segment compared to both the parent-directed play and child-directed play segments.

In testing each hypothesis, I began by examining whether child sex moderated the predicted relationships among the variables of interest. When there were significant interactions between a predictor variable and child sex, the analyses were subsequently

performed and reported separately for boys and girls. Otherwise, the reported results are based on analyses using data for males and females combined.

Hypothesis 1

As a test of the direct effects of ROM on behavior, postulated by the independent influence hypothesis, the association between the severity of ROM and child behavior problems was examined first. It was hypothesized that a severe history of ROM during the first three years of life will be positively associated with a greater number of child behavior problems (as observed during parent-child interactions in the laboratory), when compared to children who had experienced fewer and less severe episodes of otitis media.

Hypothesis 2

As a test of the indirect effects of ROM severity on behavior, also postulated by the independent influence model, it was predicted that a severe history of ROM would be associated with observations of less effective parent-interactive behaviors (both lower levels of parental warmth and lower levels of positive parental control). Similarly, it was expected that less effective parenting behavior would be positively associated with a greater number of child behavior problems during the observed parent-child interactions.

Hypothesis 3

Finally, as a test of the "buffering hypothesis", it was expected that more effective parenting behaviors, defined by greater parental warmth and positive parental control behavior, would moderate the potentially deleterious effects of ROM on children's behavioral problems. Thus, it was expected that high levels of parental warmth and positive parental control would be associated with fewer child behavior problems during the observed parent-child interactions.

Methods

Participants

The participants for the present study included 56 children (28 males and 28 females) between three and four years of age, and their parents. Child participants ranged in age from 35 to 51 months (M=42 months, S.D. = 4.9) and were identified from the patient roster of a university-based pediatrics clinic. In order to study intact families and avoid the potentially confounding influences of poverty or other major life stresses on child development, families were asked to participate only if (1) parents were married and living in the home; (2) both parents had at least a high school education; (3) a minimum of one parent was employed on a full-time basis and the family was not receiving public assistance; (4) the family included not more than four children; and (5) the target child did not suffer from any other serious medical condition, disability or history of chronic illness other than ROM. Sixty-eight percent of the families initially identified from the clinic rosters who met the inclusion criteria were located, contacted by phone and agreed to participate. Unfortunately, limited information was available both on the children's illness histories and the demographics of families who could not be located and/or those families that refused participation once contacted. Eighty-six percent of the participating families were White; and 82% of mothers and 91% of fathers had at least some college education. Seventy-seven percent of the fathers were employed in lower middle to upper middle class occupations or were full-time graduate students. Approximately 70% of the mothers were employed and 36% were working at least 21 hours per week. Families were provided a cash remuneration for their participation in the study.

Participants were not selected on the basis of the child's otitis media history, but once a family joined the study the child's history of otitis media was determined. Medical records were obtained from each medical facility in which the child had been evaluated during his/her first 3 years of life. From those records both the number of separate episodes of otitis media and the total number of days of effusion over the first 3 years were determined. As recommended by Teele et al. (1984), effusion was estimated to have lasted 29 days (per episode) when it was impossible to make a more precise determination from information contained in the medical records. The total number of separate episodes of otitis media during the children's first three years of life ranged from 0 to 11, with a mean of 4.2 (S.D = 2.7). The estimated total number of days with effusion ranged from 0 to 480 days, with a mean of 133 (S.D. = 100). Fifty-three percent (n = 29) of the children had suffered from "recurrent" otitis media (defined as three or more separate episodes within 12 months; Teele et al., 1984, 1990; Vernon-Feagans et al., 1996) at least once between 0 and 3 years of age. In addition, twenty-five percent (n = 14) of the children had suffered at least 4 or more episodes of otitis media (within a given 12 month time span) at least one time during their first three years of life.

Procedures

Potential participants initially were identified from computer printouts of all patient contacts and diagnoses for three to four year old children who had been seen at the Pediatrics Clinic, College of Osteopathic Medicine at M.S.U. The computer listings included dates of contact and specific diagnoses, making it possible to determine children's histories of otitis media and other illnesses. All families initially identified as potential participants through the screening process were sent a letter describing the nature and

purpose of the study. In the letter, parents were asked to consider participating in the study and were informed that a member of the research team would call them as a follow-up to the letter.

Shortly after families had been sent the initial recruitment letter they were contacted by telephone. At that time, mothers were asked to participate in a brief (20 - 30 minute) phone interview. During the phone interview the interviewer carefully explained the nature of the study, collected additional information on the child's health history (including a detailed account of the mother's recollection of OM episodes), and determined whether or not the family met the criteria for inclusion. If the family met all of the inclusion criteria they were asked if they were willing to participate.

Following the telephone interview, one of the members of the research team made a visit to the family's home. After obtaining the parent signatures on the informed consent forms, the interviewer explained to the parents that they would be paid $75.00 for their participation and interviewed both parents. Following the parent interview, the interviewer secured signed release of information forms to obtain any additional medical records on the child if they had been seen by a physician outside the MSU Clinical Center, and left a set of questionnaires for the parents to fill out prior to their visit to the clinic for the observational session.

Clinic observational sessions

Two 15-minute, semistructured dyadic parent-child interaction sessions were conducted and videotaped in a clinic laboratory setting, one session was with the mother and child and one was with the father and child. The order of the mother or father interaction sessions was randomly counterbalanced to control for order effects. Visits for

the observational sessions were scheduled approximately two weeks apart and at times in which the child was not experiencing any episodes of otitis media, according to the parent's reports. The observational sessions took place in an 11 by 16 foot laboratory playroom, located within the MSU Psychological Clinic. The playroom was equipped with two ceiling microphones, a one-way mirror, an adjacent observation room, and videotape equipment. Two chairs and a table were placed in the center of the room, facing the one-way mirror. One of two matched sets of toys was arranged in a specified manner for each interactional session. The toys in the first toy set included (1) a wooden truck with several zoo animals, (2) crayons and a pad of paper, (3) several plastic colored rings on a post, and (4) a box of plastic "waffle" blocks. The second set of toys included (1) a foam puzzle, (2) a toy doctor's kit, (3) a Mr. Potato Head set and (4) a box of Duplo blocks.

Each parent and child was videotaped during the three standardized situations (Eyberg & Robinson, 1983) that comprise the dyadic interactional task: (1) the Child-Directed Interaction (5 minutes), (2) the Parent-Directed Interaction (5 minutes), and (3) the Clean-up (1-10 minutes). Instructions for each of the three situations were provided through a "bug-in-the-ear" microphone by an observer behind a one-way mirror, such that only the parent was able to hear the instructions.

The first situation was the least structured, and during the Child-Directed Interaction, the parent was instructed to tell the child to play with whatever the child wanted to choose. The parent then was told to allow the child to choose an activity and they were to follow the child's lead and play along with him or her. In the more-structured Parent-Directed Interaction, the parent was instructed to inform the child that it was the

parent's turn to choose an activity. The parent then was told to keep the child playing with them according to the parent's own rules. In the final and most structured situation, the Clean-up Interaction, the parent was instructed to tell the child that they were finished playing and the toys must be put away. The parent then was told to make sure they had the child put the toys away. These three situations were specifically designed to vary in the degree to which parental directiveness or control was required, in order to assess whether increased structure would lead to a corresponding increase in observed child behavior problems.

Dependent Measures

Summary categories. Nineteen categories of parent and child behaviors (see Table 1 for examples) were used to code the parent-child interactions during the three segments of the observational task (Eyberg & Robinson, 1983). Discrete types of parental behaviors were grouped on an a priori basis, by the present investigator, to form the two dimensions of parenting that have been underscored in the socialization literature: parental warmth or responsiveness and parental control. Based on the critical evaluation of the definition of parental control within the developmental and clinical literature, an attempt was made to further divide the parental control dimension into two sub-dimensions: "positive" parental control and "negative" parental control.

Parental warmth or responsiveness was defined, by the present investigator, by combining a group of behaviors contained within the Eyberg & Robinson (1983) Dyadic Parent-Child Interaction Coding System that were presumed to be indicative of parental warmth, attentiveness, and positive responsiveness to the child. These included the following behaviors: high levels of labeled and unlabeled praise, positive physical

Table 1. Examples of parent & child behaviors coded with the Dyadic Parent-Child Interaction Coding System.

Labeled Praise:	"I like the way that you drew that house".
Unlabeled Praise:	"That was a good job".
Positive Physical Contact:	Parent pats the child's arm in an affectionate manner.
Reflective Statement:	Child: "My teacher is taking us to the zoo next week". Parent: "Oh, you're going to go to the zoo soon?".
Descriptive Statement:	"You're putting the cow in the barn".
Descriptive/Reflective Question:	"Where does that piece go?"
Acknowledgement:	Child: "Is this the right place, mommy?" Parent: "Yes it is".
Critical Statement:	"You didn't do a very good job cleaning up in here, young man".
Direct Command:	"Put the blocks into the box".
Indirect Command:	"How about giving me that one?"
Negative Command:	"Don't get up on the table!".
Physical Negative Contact (Parent):	(Parent grabs a toy away from the child after the child won't start cleaning up.
No-opportunity Command:	"Put the toys away", (2 seconds) "Come on and put them away, now!"

Table 1 (cont'd).

Irrelevant Verbalization:	"I wonder what your sister is doing right now".
Cry:	(Child gives an inarticulate utterance of distress for 5 seconds).
Whine:	(Child says in a high-pitched, nasal voice) "But I don't want to clean up now!"
Yell:	(Child makes a loud scream for 3 seconds).
Smart Talk:	"No!, you put the toys away!".
Destructive Action:	(Child slams a toy on the table and breaks it into several pieces).

Physical Negative Contact (Child): (Child hits parent).

Compliance:	(Child obeys, begins to obey, or attempts to obey a direct or indirect command).
Noncompliance:	(Child does not begin to obey a parental command within 5 seconds or actively begins an incompatible activity).

Note. From "Dyadic Parent-Child Interaction Coding System: A Manual," by S. M. Eyberg and E. A. Robinson, 1983. (Available from S. M. Eyberg, University of Florida, Gainsville, FL).

contact, reflective statements, descriptive statements, descriptive and/or reflective questions, and acknowledgements (see Table 2). Labeled praise included any statement which expressed a positive evaluation of a child's specific activity, product, or personal attributes, whereas unlabeled praise was a nonspecific positive evaluation of a child's activity, product, or personal attributes. Physical positive behavior was coded when there was any neutral or positive physical contact between parent and child. Reflective statements were declarative phrases that followed a child's verbalization, which contained the same basic content as the child's original statement. A descriptive statement was a declarative statement that provided an account of the objects, people, or activities occurring during the interaction. Descriptive/reflective questions were descriptive or reflective statements phrased in the form of a question, which followed, rather than attempted to direct, the child's activity. Finally, acknowledgments were brief responses to children's verbalizations which contained no apparent content other than a simple yes or no response. The parental warmth dimension was also defined by low levels of critical statements which were assumed to reflect parental hostility toward the child. Critical statements consisted of any negative evaluations of the child's activities, products, or personal attributes.

The "positive" parental control dimension was defined in the present study by high levels of direct and indirect commands, which reflected parent's attempts to control or otherwise direct children's behavior in a clear and/or positive manner. Direct commands were clearly stated directives that contained specific information as to what was expected of the child. Indirect commands were directives which were nonspecific, implied, or stated in the form of a question.

Table 2. A priori clusters of parent and child behaviors

Warmth	**"Positive" Control**	**"Negative" Control**	**Child Negative Behavior**
Labeled Praise	Direct Commands	Negative Commands	Cry
Unlabeled Praise	Indirect Commands	No-opportunity Commands	Yell
Positive Physical Contact		Physical Negative Behavior	Whine
Reflective Statements			Smart Talk
Descriptive Statements			Destructive Action
Descriptive/Reflective Questions			Physical Negative
Acknowledgements			
Critical Statements (reverse coded)			

The "negative" control dimension was defined in the current study by high levels of negative commands, no-opportunity commands, and physical negative behavior (parent). These negative control techniques were assumed to represent punitive, coercive, and harsh methods of attempting to obtain compliance. Negative commands were commands which directed a child to stop or inhibit their behavior. No-opportunity commands were commands that did not allow ample opportunity for compliance. Physical negative behavior (parent) was coded when a parent initiated contact with a child which inflicted pain, restrained the child, or accompanied a critical statement.

The various coded child negative behaviors included the following: cry, yell, whine, smart talk, destructive action, and physical negative. The frequencies of all parent and child behaviors were coded continuously during each 5-minute videotaped segment, yielding total frequency scores for each category of behavior. The various child deviant behavior frequency scores (cry, whine, yell, smart talk, destructive action, and physical negative) were summed together to yield a "total child deviant behavior" frequency score. All three task segments were designed to last 5 minutes each, but the Clean-up segment often was completed in less than the allotted amount of time. Hence, the various child and parent behavior frequency scores were subsequently transformed into scores representing rates of occurrence (frequency divided by time in seconds), to account for the variability in time across the three standardized situations that comprised the dyadic interactional task.

Taping and coding procedures.

Parent-child interactions were recorded on videotape and subsequently coded at a later date. Coding of the observational sessions was done by at least one of four trained

coders (three undergraduate students and one graduate student), all of whom were blind to the specific ROM status of the children at the time of coding. Initially, the coders received over 20 hours of extensive training in the Dyadic Parent-Child Interaction Coding System (Eyberg & Robinson, 1983) and were required to maintain a 70-80% rate of reliability (Cohen's kappa) with practice tapes before they were allowed to begin coding study tapes. In order to further maximize the accuracy of the observational training a criterion tape which had been coded by one of the authors of the DPICS was included in the set of practice tapes. Throughout the course of the study weekly training and practice sessions were also held to maintain coding accuracy.

Results

Measurement Issues.

Reliability of the behavioral observation variables.

Interrater reliability for the observational data. Interrater reliability checks were conducted by randomly selected pairs of coders throughout the process of coding the full set of videotapes. These interrater reliability checks were conducted on approximately 25% of the study videotapes (randomly selected). Reliability of the frequency data was measured by Cohen's kappa, where reliability coefficients were calculated for each separate pair of reliability codings of the nineteen individual child and parent behaviors (Jacob, Tennenbaum & Krahn, 1987). Cohen's kappa coefficients, computed across tasks and indicating levels of interrater reliabilities for the frequency ratings of individual sets of nineteen child and parent behaviors (across tasks), ranged from .59 to .85 (M=.73). Cohen's kappa coefficients, computed within tasks, were as follows: 1) child-directed segment (M= .76, range = .41 to .90); parent-directed segment (M= .74, range = .44 to .83); and 3) clean-up segment (M= .69, range = .35 to .79). The Cohen's kappa coefficients for the full set of frequency ratings of individual sets of coded videotapes, across and within task segments, are summarized in Table 3 in Appendix A.

Reliability for the summary variables. Rate data initially were aggregated into summary variables describing child negative behavior and mother or father warmth and control, as described earlier; these variables were computed both across and within observational segments or tasks (child-directed, parent-directed, clean-up). Internal consistency of the summary variables was assessed by Chronbach's Alpha, and inter-rater reliability for these variables was assessed by Pearson r correlation coefficients, across all

pairs of reliability codings for each of the summary variables (across tasks and within each of the individual segments).

Table 4 (see Appendix B) contains the final groupings of parent and child behavior which yielded the highest coefficient alphas for the two separate scales of parent behavior and single child negative behavior scale. Due to the strong relationship between labeled and unlabeled praise, they were combined into a general category of parental praise. For both mothers and fathers, the highest alpha for the parental warmth scale was obtained with the same group of five of the seven parent behaviors (descriptive/reflective questions, descriptive statements, reflective statements, praise, & acknowledgements). The behaviors positive physical contact and critical statements were dropped from the parental warmth scale due to both a low rate of occurrence and/or a low correlation with the scale. It is important to note that although the parental warmth scale exhibited adequate overall internal consistency, there was poor internal consistency in the parent-directed segment, which improved only slightly in the clean-up segment.

For parental control, it did not appear that there were two separate sub-scales of parental control ("positive" and "negative"), as had been expected. Rather, parental control behaviors were part of a single dimension, which differed somewhat for mothers and fathers. The single resulting parental control scales for mothers and fathers were utilized in all subsequent analyses.

For mothers, the parental control scale (alpha= .67) was best defined by the following behaviors: direct commands, direct commands/no opportunity, indirect commands/no opportunity, negative commands, critical statements, and physical negative behavior. Indirect commands were dropped from the parental control scale due to a low

correlation with other types of control behavior and with the overall scale. Although the category of critical statements was originally placed within parental warmth scale (inversely scored), it appeared to correlate more highly with the behaviors within the parental control scale. Contrary to what had been expected, the categories of negative commands, no-opportunity commands, critical statements, and physical negative behavior were positively correlated with direct commands, rather than negatively correlated. For fathers, the parental control scale (alpha=.65) was best defined by the same group of behaviors as for mothers, minus the categories of critical statements and physical negative behavior. These latter two behaviors were not included in the final Father Control scale because they substantially lowered the internal consistency of the scale. The categories of critical statements and physical negative behavior were not correlated with many of the remaining items or the overall scale.

Table 5 shows the number of items and alpha coefficients for each of the summary variables within and across segments (range = .05 to .74, $\underline{M}$=.53) and Table 6 shows the Pearson product-moment correlations, computed across the full set of paired reliability coders, for each of the summary variables (across tasks and within each individual segment) used in the data analyses (range = .72 to .99, $\underline{M}$=.92). Alpha's and interrater reliability coefficients could not be calculated for child negative behaviors during the child directed tasks with fathers or mothers because behaviors conprising these scales rarely occurred during this observational segment. Alphas for the summary variables generally were acceptable with the notable exception of parental warmth during the parent-directed segment of the interaction task (especially the mother-directed

Table 5. Number of items and internal consistency of parent & child behavior scales.

	No. of items		Alpha	
	Mothers	Fathers	Mothers	Fathers
Parent Warmth				
Total	5	5	.50	.56
Child directed	5	5	.63	.74
Parent directed	5	5	.05	.22
Clean-up	5	5	.33	.46
Parent Control				
Total	6	4	.67	.65
Child directed	6	4	.57	.50
Parent directed	6	4	.67	.55
Clean-up	6	4	.55	.48
Child Problem Behavior				
Total	22	14	.66	.71
Child directed[a]	---	---	---	---
Parent directed[b,c]	10	5	.70	.37
Clean-up[d]	9	8	.54	.70

[a] Child Problem behaviors rarely occurred so that alphas could not be computed.

[b] Child initiated crying and destructive behavior did not occur during the mother directed task.

[c] Child initiated crying, yelling, whining, smart talk, destructive behavior, and physical negative behaviors did not occur during the father directed task.

[d] Child initiated yelling, smart talk, and physical negative behavior did not occur during clean up with mothers or fathers and child responding physical negative behavior did not occur during clean up with fathers.

Table 6. Interrater reliability coefficients (Pearson rs) for the summary variables.

	Mother Observations	Father Observations
Child Negative Behaviors		
Total	.94	.93
Child directed[a]	--	--
Parent directed	.94	.92
Clean up	.93	.94
Parent Warmth		
Total	.98	.95
Child directed	.98	.96
Parent directed	.99	.85
Clean up	.98	.98
Parent Control		
Total	.94	.92
Child directed	.96	.82
Parent directed	.81	.87
Clean up	.94	.94

[a] Frequencies of child negative behavior during the child-directed segments were too low to calculate interrater reliabilities.

segment) and to a lesser degree, parental warmth during the clean-up segment. Nevertheless, interrater agreement on ratings of the summary variables generally was high.

Computation of recurrent otitis media (ROM) severity.

The correlation between the two otitis variables (total days of effusion and total number of episodes) was .73, $p<.001$. Thus, a single indicator of otitis severity ("ROM severity") was computed by standardizing and averaging these two variables.

Demographic Relationships

Sex differences. Analyses comparing males and females on each of the standardized variables considered in this study identified relatively few differences between males and females. Out of a total of 36 comparisons, only two were significant at the .05 level which is approximately what would be expected by chance: Across tasks, fathers were warmer with their daughters ($M = .89$) than with their sons ($M=-1.05$; $p<.05$); sex differences in father warmth were significant at the .01 level in the child-directed task, but were not significant in the father-directed and father clean-up tasks.

Correlations with other demographic variables. Correlations between the variables considered in the research hypotheses and three other demographic variables (child age in months, father and mother educational attainment) resulted in 6 significant relationships. Because I tested 76 relationships in all, four would be expected by chance. Three of the significant findings indicated that more educated fathers were warmer in their interactions with their children (overall and during the father directed and clean-up tasks) than less educated fathers (significant r's ranged from .33 ($p<.05$) to .44 ($p<.001$). In addition, younger children behaved more negatively with their fathers overall ($r = -.28$, $p<.05$) and during the father directed task ($r=-.38$, $p<.01$). One other correlation between

mother education and child negative behavior during the father directed task ($r = .37$, $p<.01$) was difficult to explain. It should be noted that the variable ROM severity was not significantly correlated with any of the demographic variables. This finding is consistent with at least one prospective, epidemiological study that found no relationship between ROM and SES (Teele et al., 1990). Additional correlations among each of the variables considered in the a priori hypotheses are summarized in Table 7 in Appendix C.

Within task variation in child and parent behavior.

Repeated measures analyses using a 3 (Type of Task) x 2 (Child Sex) design assessed whether task variation (child-directed, parent-directed, or clean up) would elicit different frequencies of child negative behavior and mother or father warmth or control behaviors. Analysis of child negative behavior, using the mother-child interaction data, resulted in a significant effect for Task ($F(2,104) = 5.8$, $p<.01$) and also in a significant Sex x Type of Task interaction ($F(2,104) = 4.9$, $p<.01$). Analysis of the father interaction data resulted in a significant effect for Type of Task, but effects involving Sex were not significant. As can be seen in Table 8, even though between-task comparisons were not always statistically significant, the general pattern was for child negative behavior to increase as the task situation became more structured (i.e., from child-directed to parent-directed to clean-up). An exception was that boys behaved most negatively in interactions with their mother when the play task was mother (rather than child-) directed; in contrast, girls behaved most negatively when their mother directed them to clean up. For both sexes, child negative behaviors occurred at a very low frequency during the child-directed segments.

Table 8. Average rates (frequencies per second) of child and parent behaviors within observational tasks.

	Mother Interactions[d]			Father Interactions[e]		
	Child Directed	Parent Directed	Clean up	Child Directed	Parent Directed	Clean up
Child Negative Behavior						
All	.0006[a]	.0047[b]	.0061[b]	.0001[a]	.0040[b]	.0104[b]
Males	.0008[a]	.0073[a]	.0034	.0000[a]	.0047[b]	.0088[b]
Females	.0003[a]	.0022[a]	.0089[a]	.0002[a]	.0033[a]	.0120[a]
Parent Warmth						
All	.1911[a]	.1669[b]	1373[c]	.1925[a]	.1790[a]	.1422[b]
Males	.2086[a]	.1800[a]	.1261[b]	.1580[a]	.1669[a]	.1298[b]
Females	.1743	.1542	.1485	.2258[a]	.1907[b]	.1542[c]
Parent Control						
All	.0148[a]	.0598[b]	.0633[b]	.0143[a]	.0620[b]	.0681[b]
Males	.0158[a]	.0648[b]	.0690[b]	.0130[a]	.0588[b]	.0677[b]
Females	.0139[a]	.0548[b]	.0575[b]	.0156[a]	.0652[b]	.0685[b]

[d] Row means for mothers with the same superscript do not differ significantly ($p>.05$)

[e] Row means for fathers with the same superscript do not differ significantly ($p>.05$)

Table 8 shows differences in parent warmth and control within each of the observational segments. A repeated measures analysis using a 3 (Type of Task) x 2 (Child Sex) design resulted in significant Task, as well as Task x Sex interactions for both mother warmth (for Task, $F(2,104) = 17.7$, $p<.001$, and for the 2-way interaction, $F(2,104)= 5.5$, $p<.01$) and father warmth (for Task, $F(2, 106) = 13.8$, $p<.001$, and for the 2-way interaction, $F(2,106) = 3.3$, $p<.05$). Only the Task repeated measures factor was significant when parent control was compared within situations (for mothers, $F(2,104)= 46.0$ and for fathers, $F(2,106) = 67.3$, p's$<.001$). As can be seen in Table 8, mothers became less warm as the task became more structured, but these differences were stronger and only statistically significant when mothers interacted with their sons (rather than daughters). In contrast, fathers became less warm in interactions with their daughters as structure increased from one task segment to the next. However, with their sons, fathers showed less warmth in the clean up as compared to the child or father directed situations, but warmth during the child and father directed tasks did not differ significantly (and actually was somewhat higher when the father rather than the child directed the play interaction). Finally, task differences in parent control mostly resulted because both mothers and fathers were less controlling during the child directed task as compared to the parent directed or clean up tasks.

Tests of the Research Hypotheses

In examining each of the research predictions, I tested whether child sex would moderate the predicted relationships by assessing the significance of relevant sex x predictor variable interactions. Data are presented for males and females, combined, except in those instances in which the sex x predictor interactions were statistically

significant ($p < .05$). Significant interactions were followed up by within sex analyses so that results for these hypotheses could be presented separately for girls and boys. Because of the large number of effects resulting from the various analyses I only interpreted those effects that involved ROM severity. Tests of the hypotheses predicting child negative behavior were performed using variables summarized across task segments and variables within the parent-directed and clean-up segments. Because of the low frequency of observed child negative behavior during the child-directed segment, I did not separately consider data from this segment in the analyses.

Hypothesis 1: Relationships between ROM severity and child negative behavior. Regression analyses in which child negative behavior across tasks was regressed on ROM severity did not result in any significant relationships for interactions with mothers or fathers. Similarly, ROM severity was unrelated to child negative behavior observed within the child-directed, parent-directed, and clean-up segments of the parent-child interactions.

Hypothesis 2: Relationships between a) ROM severity and parent warmth and control and b) parent warmth and control and child negative behavior. Regression analyses predicting mothers' warmth or control from ROM severity did not result in any significant relationships across or within each of the interaction segments (univariate correlations are shown in Table 9). These relationships also were mostly insignificant when warmth and control referred to fathers; the one exception was a significant interaction between child sex and ROM severity in predicting father warmth (beta =.33, $p<.05$). Follow up analyses indicated that ROM was associated with more father warmth with sons (beta = .34, $p<.09$) and less warmth with daughters (beta = -31, $p<.13$), but

Table 9. Correlations between ROM severity and Parental Warmth and Control

	Mothers		Fathers	
	Warmth	Control	Warmth	Control
Observational Segment	r	r	r	R
Total	.18	.17	-.08	.08
Child directed	.20	-.05	-.10	.06
Parent directed	.21	.22	.04	.09
Clean-up	.08	.08	-.03	.01

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

neither of these relationships was significant at conventional levels.

Regression analyses predicting child negative behavior from parental warmth and control identified a significant relationship between mother control behaviors and child negative behaviors across tasks (beta = .51, $p<.001$), with more control associated with more negative child behavior. Within tasks, there was a significant sex x mother control interaction for the mother directed task (beta = .28, $p<.05$). Follow-up analyses indicated that mother control was associated with more child behavior problems among boys (beta =.72, $p<.001$), but was more weakly (and not significantly) related to negative behavior among girls (beta= .24, p, n.s.). As can be seen in Table 10, no other relationships between parental warmth or control and child negative behavior were statistically significant.

Hypothesis 3: The buffering implications of parent warmth and control for the effects of ROM severity on child negative behaviors. Tests of Hypothesis 3 were based on regression analyses examining the significance of a) interactions between ROM severity and parental warmth as well as b) ROM severity and parental control in predicting child negative behavior. Interaction terms were computed as cross-products and tested in a stepwise fashion after controlling for the relevant main effects and simpler interaction effects. As in the tests of the previous hypotheses, initial analyses assessed whether child sex would moderate any of the predicted relationships and examined the relevant relationships across, as well as within different types of tasks.

Interactions between ROM and father warmth or control were not statistically significant regardless of the type of interaction task (see Table 11). Alternatively, mother warmth interacted with ROM severity in predicting child negative behavior across

Table 10. Beta coefficients resulting from regressing child negative behavior on parental warmth or control.

	Mothers		Fathers	
	Warmth	Control	Warmth	Control
Observational Segment				
Total	.02	.49[c]	-.02	.11
Child directed	--	--	--	--
Parent directed	.03	.66[c]	-.16	.20
Clean-up	.08	.08	.24	.07

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

Table 11. Beta coefficients resulting from regressing child negative behavior on ROM severity, parental warmth, and parental control within observational segments.

	Predictor Variables			Interaction Effects		
	ROM	Warmth	Control	R x W	R x C	R x C x W
	beta	Beta	beta	beta	beta	beta
Mothers						
Total	.14	-.04	.48[c]	-.29[a]	--	--
Child directed	--	--	--	--	--	--
Parent directed	.08	-.06	.65[c]	--	--	--
Clean-up	.11	-.07	.14	--	--	--
Fathers						
Total	-.04	-.04	.12	--	--	--
Child directed	--	--	--	--	--	--
Parent directed	-.12	.20	.24	--	--	--
Clean-up	-.02	.09	.07	--	--	--

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

situations. As can be seen in Figure 2, when mothers showed greater warmth, children with a severe history of ROM showed less negative behavior whereas children without an ROM history showed more negative behavior. In addition, Child Sex interacted with Control and ROM in predicting child negative behavior during the mother-directed task (beta = .29, $p<.05$). Figure 3 shows the nature of this interaction. In particular, greater mother control was associated with less child negative behavior among girls with a history of severe ROM and with more negative child behavior among girls without a severe ROM history. Alternatively, more maternal control was associated with more negative behavior among boys with a history of severe ROM and had a slightly positive, but generally weak relationship with negative behavior among boys without this history.

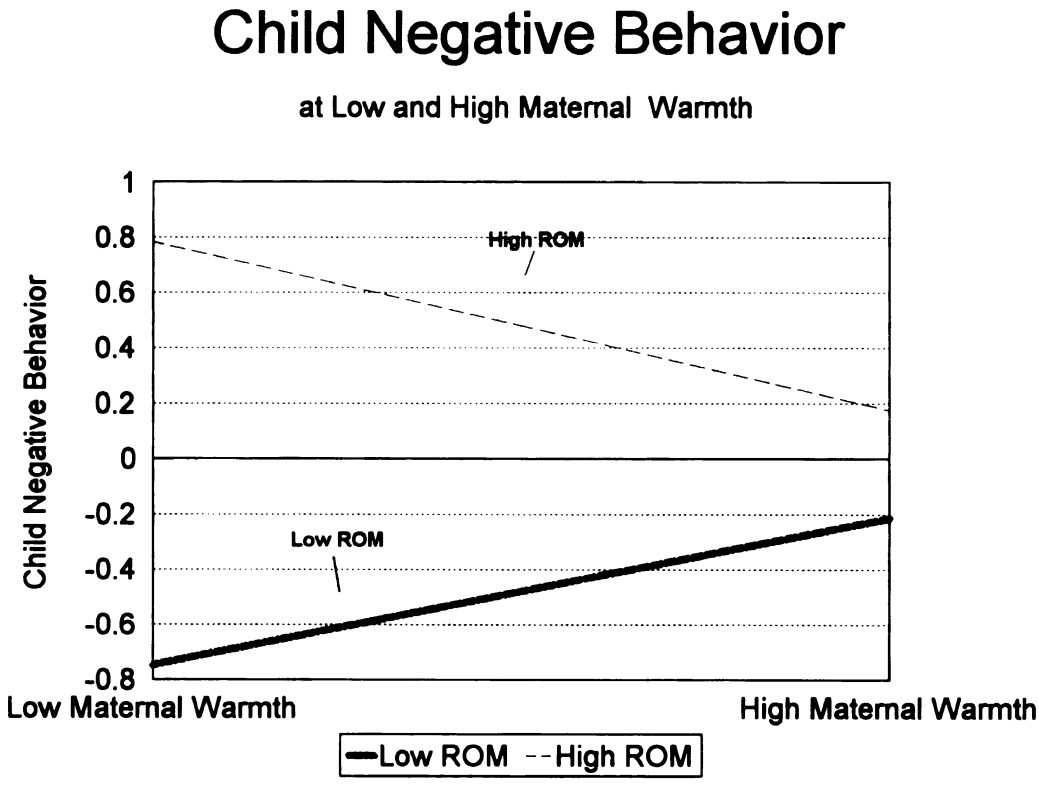
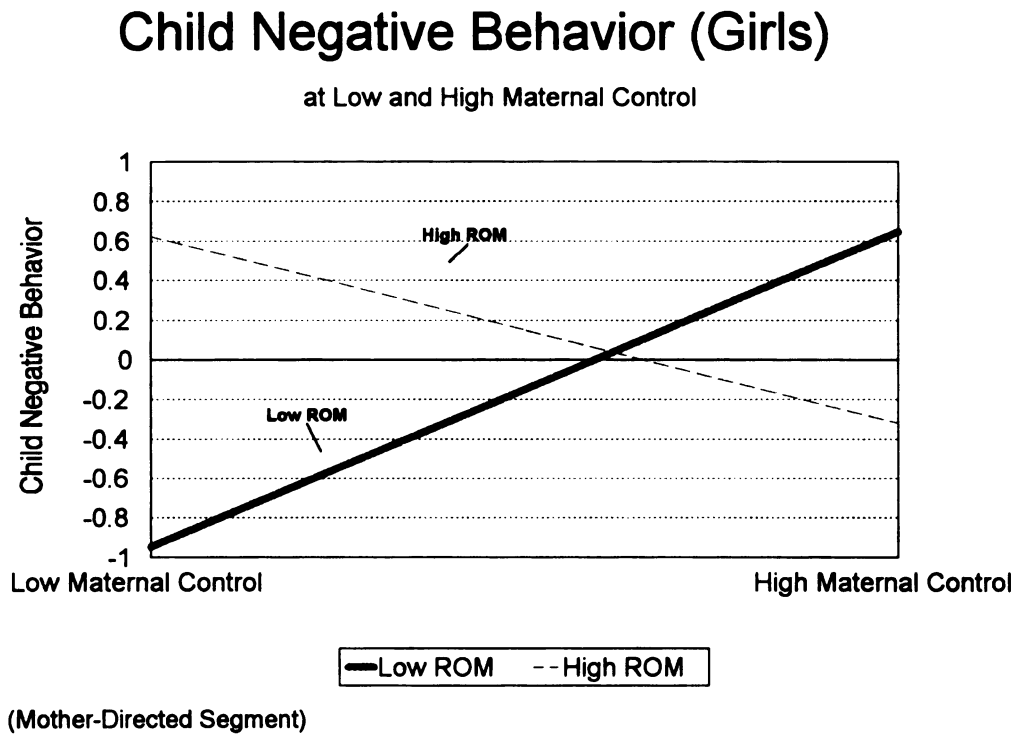


Figure 2: Relationship between (a) ROM severity, (b) maternal warmth, and (c) child negative behavior.



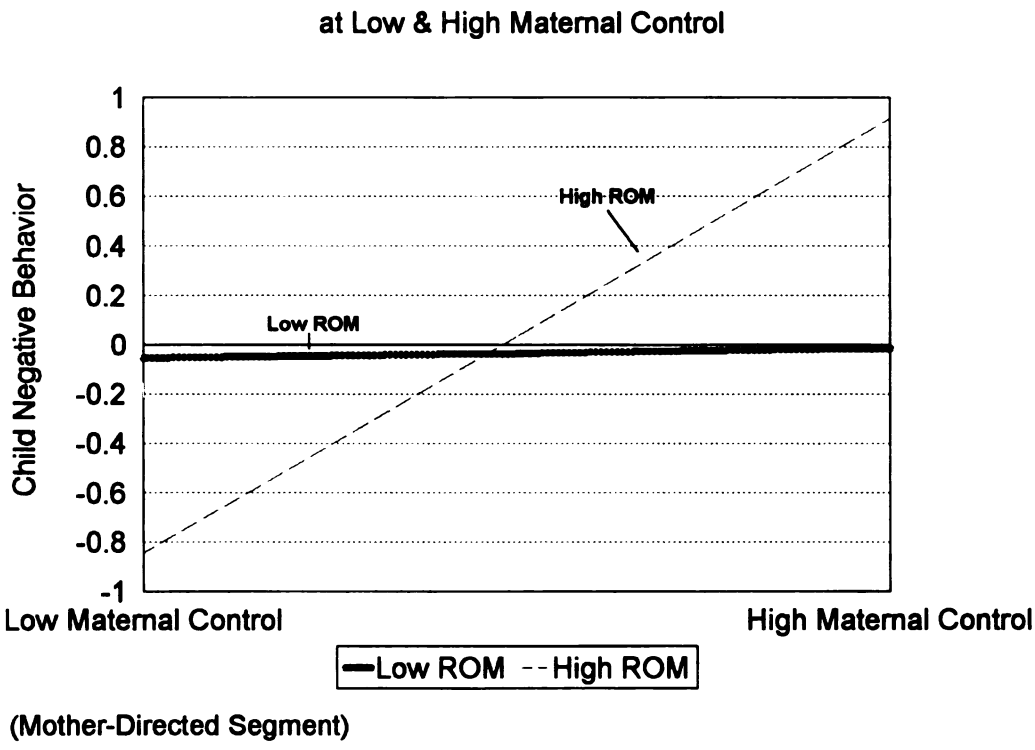


Figure 3 : Relationship between (a) ROM severity, (b) maternal control, and (c) children's negative behavior.

Discussion

The purpose of the present study was to assess the potential impact of ROM on child behavior and parent-child interactions in a group of families with children who had varying degrees of ROM during the first three years of life. It was anticipated that the quality of parent-child interactions would play a role in minimizing or moderating the deleterious effects of ROM on children's behavioral functioning. Data analyses tested two alternative models (the "independent influence" and "buffering" models) postulating relationships between the severity of children's ROM during the first three years of life, style of parental interactive behavior (parental warmth and parental control), and children's behavioral adjustment at three to four years of age.

The first model, the "independent influence" model, postulates that an early history of ROM and positive parenting behaviors (warmth and control) independently influence children's behavioral adjustment in opposite ways. According to this model, recurrent otitis media and parenting independently contribute to children's behavior so that children who have suffered from severe histories of ROM will be better adjusted if they are exposed to effective parenting behavior (both high parental warmth and positive parental control), but would not be as adjusted as children without early histories of ROM who are equally exposed to effective parenting behavior.

The second model, the "buffering" model, argues that an effective style of parental interactive behavior buffers the deleterious effects of ROM on child behavior. Thus, those children with severe histories of ROM exposed to less effective parental interactive behavior will exhibit problems with their behavioral adjustment. However, children with early histories of ROM who were exposed to effective parental interactive behavior will be

nearly, or just as well adjusted as children raised in similar environments, but without severe histories of ROM. The present study sought to determine whether style of parental interactive behavior and ROM history were independently associated with child behavior problems, as suggested in the "independent influence" model or whether style of parental interactive behavior would moderate the relationship between ROM and child behavior problems, as suggested by the "buffering" model.

In general, the findings presented here provided little support for the "independent influence" model. A history of ROM predicted neither children's negative behavior, nor parental warmth or control during the parent-child interaction task, with a single exception. The one exception was a significant interaction between child sex and ROM severity in predicting father warmth. The direction of the beta coefficients suggested that ROM severity is associated with more father warmth with sons, and less warmth with daughters. However, subsequent within child gender analyses indicated that neither of these relationships was significant at conventional levels.

In contrast, some support was found for the "buffering" model in that the results suggest style of parental interactive behavior may moderate the relationship between ROM and child behavior problems; however the findings were not always in the predicted direction. Specific findings for each of the a priori hypotheses formulated from the two models are discussed in greater detail in the section which follows.

Hypothesis 1:

The hypothesis that severity of ROM would be positively associated with observed child behavior problems was not supported by the present analyses. Previous studies showing correlations between severity of ROM history and parental reports of behavior

problems implied that such a relationship should exist (e.g., Casey, 1983; Feagans & Proctor, 1994; Forgays, Hasazi & Wasserman, 1992; Gottleib, Zinkus & Thompson, 1979; Iverson, 1987; Roberts, Burchinal & Campbell, 1994; Vernon-Feagans, Manlove & Volling, 1996). However, many of these earlier findings were based on maternal responses to a child behavior problem questionnaire rather than actual observations of child behavior in a laboratory setting. One possibility is that there is no direct relationship between severity of ROM history and observed child behavior problems, as indicated by the findings from the present study. Alternatively, it may have been the case that the relatively brief, single point-in-time, laboratory observation of child negative behavior, within the context of the structured parent-child interaction task, was not a sensitive enough measure to detect the behavioral patterns that were hypothesized to exist, as compared to maternal reports which are based on maternal observations over a more extensive period of time. It also is possible that a longer observational period and/or a more naturalistic setting would allow for a more valid assessment of behavioral problems during parent-child interactions.

The actual severity of ROM history was a second factor that may have influenced the results of the present study. The mean number of episodes of ROM in the present study was relatively low, 4.18 episodes across the first three years of life. This is in contrast to the severity of ROM found in samples of participants used in other studies. Table 12 contains a summary of the characteristics of participants, including ROM severity, and the design features of several recent studies examining the relationship between ROM and children's behavior and/or functioning. For example, there were 5.4

Table 12. Summary of the characteristics of participants and design of recent ROM studies.

Author(s)	Sample size	Design	Age group	SES	ROM episodes
Casey, 1983	n = 60	cross-sectional	56.76 months[a]	middle-class	15.63 (across 3 years)
Forgays et al., 1992	n = 79	cross-sectional	25.7 months[b]	middle-class	8.84 (across 2 years)
Roberts et al., 1995	n = 61	longitudinal	birth – 8 yrs.[c]	62.3% low-income	7.00 (across 3 years)
Teele et al., 1990	n = 207	longitudinal	birth – 7 yrs.[d]	mixed SES	3.79 (across 3 years)
Vernon-Feagans et al., 1996	n = 36	longitudinal	12 – 36 mos.[e]	middle-class	36% of time (per year)[f]
Wallace et al., 1996	n = 26	longitudinal	birth - 2 yrs.[g]	low SES	5.40 (across 2 years)

[a] mean age presented for ROM group only. The mean age for the group of control children was 56.80 months.

[b] mean age at recruitment, with 6 month follow-up.

[c] sample recruited at birth and followed up longitudinally for 8 years.

[d] sample part of a larger epidemiological sample recruited at birth and followed up longitudinally for 7 years.

[e] sample recruited at age 12 months and followed up longitudinally for an average of 24 months.

[f] children with otitis media at least 20% of the time were designated as having chronic otitis media.

[g] sample recruited at birth and followed up longitudinally for 7 years.

episodes across the first two years of life in the Wallace et al. (1996) study; 8.84 episodes in the first two years of life in the experimental group of the Forgays et al. (1992) study; 7 episodes across the first three years of life in the Roberts et al. (1994) study; and 15.63 in Casey's (1983) experimental group of children. Only Teele et al. (1990) studied children with fewer than 4 episodes of otitis media during the first three years of life (mean number of episodes of ROM was 3.79), but their results nevertheless did reveal a relationship between ROM severity and various child cognitive, speech and language and school performance outcomes. Given that the children in the present study experienced fewer episodes of ROM than the participants in many of the earlier related studies, the potential negative effects of ROM on behavioral adjustment might have been less severe and thereby less observable, than was otherwise expected. Similarly, there may be a minimum threshold of ROM severity, below which direct negative effects on children's behavior would not be expected to exist.

Hypothesis 2:

The present study also did not yield much support for the hypothesis that a more severe history of ROM would have an indirect impact on child behavior via an effect on parenting behaviors; in particular, a more severe history of ROM was expected to be associated with observations of less effective parental-interactive behaviors (both lower levels of parental warmth and lower levels of positive parental control). As noted earlier, the single exception found was a significant interaction between child sex and ROM severity in predicting father warmth. Although the subsequent examination of this interaction did not yield statistically significant relationships between the variables of interest, the direction of the beta coefficient suggested that ROM severity might have been

associated with greater father warmth with sons and less warmth with daughters. As noted above, the overall lack of an association between severity of ROM history and parenting behaviors may have been attributable to the relatively low mean number of episodes of ROM experienced by children in the present study, as compared to other related studies (e.g., Casey, 1983; Forgays, Hasazi & Wasserman, 1992; Roberts et al., 1994; Teele et al., 1990; Wallace et al., 1996).

Hypothesis 3:

In many ways the most interesting findings came from the multiple regression analyses that were utilized to examine whether style of parental interactive behavior (parental warmth and control) would moderate the potentially deleterious relationship between ROM severity and children's behavioral problems. Maternal (but not paternal) warmth interacted with ROM severity in predicting child negative behavior across the different types of tasks. For children with a more severe ROM history, greater maternal warmth was associated with less child negative behavior. In contrast, for those children with a less severe ROM history, greater maternal warmth was associated with more child negative behavior.

For those children with more severe ROM histories, the increased maternal warmth observed in the present study may represent mothers' attempts to compensate for the negative effects of ROM on children's behavioral functioning, by providing increased instructions, cues and reinforcement. This finding is not surprising given that the sample consisted primarily of well-educated, middle-class families, so that these mothers might be more likely to display such compensatory behavior. These findings also are consistent with earlier related research that has documented a general link between increased

maternal warmth and responsiveness and subsequent decreases in child behavior problems and noncompliance (e.g., Lay, Waters & Park, 1989; Lemanek, Stone & Fishel, 1993; Martin, 1987; Rocisano, Slade & Lynch, 1987; Schaffer & Crook, 1980; Stayton, Hogan & Ainsworth, 1971; Wakschlag & Hans, 1997).

On the other hand, for those children without a history of severe ROM, greater maternal warmth was associated with more child negative behavior, which is difficult to explain at first glance. However, examination of the relative levels of child negative behavior at different levels of both ROM severity and maternal warmth (see Figure 2), indicates that low ROM severity was associated with relatively lower levels of child behavior problems, regardless of the level of maternal warmth. Thus, despite the positive association between maternal warmth and child negative behavior, the observed pattern of child negative behavior for children with less severe ROM histories remained well below the level observed for children with more severe ROM histories, and may even reflect an entirely different underlying dynamic in the parent-child relationship (e.g., greater tolerance for mildly deviant behavior by warmer parents).

With respect to parental control, there was no interaction between father's control behavior and ROM severity in predicting child negative behavior. On the other hand, there was a significant interaction among ROM severity, maternal control, and child sex, in predicting child negative behavior during the mother-directed task. For girls with a more severe history of ROM, greater maternal control was associated with less negative child behavior, whereas for girls with a less severe history of ROM, greater maternal control was associated with more negative child behavior. Conversely, for boys with a more severe history of ROM, greater maternal control was associated with more negative

behavior, whereas for boys with a less severe history of ROM, there was a slightly positive, but generally weak relationship between greater maternal control and child negative behavior.

Thus, it is clear that maternal control was interacting quite differently with ROM severity for boys and girls; however the reasons for such differences are not clear. For children with low ROM severity, boys appeared to be relatively unaffected by different levels of maternal control, whereas girls exhibited more negative behavior in the context of greater maternal control. Within this context of low ROM severity, increased maternal control behavior may have been experienced by girls as somewhat aversive, as suggested by the corresponding increase in child negative behavior. However, this latter finding is somewhat inconsistent with the findings from other studies that generally have found greater levels of compliance and shared positive affect between mothers and daughters, as compared to mothers and sons (Kochanska, 1997; Maccoby, 1990). However, it is possible that maternal control behavior may have been less normative and experienced as unfamiliar and therefore aversive by girls, as compared to boys.

In contrast, children with more severe ROM histories displayed a very different pattern of behavior within the context of different levels of maternal control. Boys with more severe ROM histories may have experienced higher levels of maternal control as somewhat aversive, as suggested by the corresponding increase in child negative behavior. In contrast, given that girls with more severe ROM histories exhibited fewer negative behaviors in relationship to higher maternal control behavior, it may have been the case that increased maternal control provided an appropriate level of structure that offset the negative effects of a severe history of ROM and/or is reflective of a greater level of

internalization of parental socialization attempts (Kochanska, 1997). However, for boys there may have been other factors involved. Other research typically has found higher levels of a range of maternal control behaviors with boys, as compared to girls, and higher levels of child negative behavior and/or noncompliance, again for boys as compared to girls (e.g., Kochanska, 1997; Lytton & Romney, 1991, Smetana, 1989). Thus, the results of the present study for boys with more severe ROM histories are consistent with findings from other related studies.

Given the cross-sectional design of the present study, it is difficult, if not impossible to determine actual causality or direction of influence of the parent and/or child behavior. Thus, it is not possible to accurately assess whether for boys (with severe ROM histories) higher levels of observed maternal control behavior represented antecedents or consequences to the child negative behavior exhibited during the parent-child interaction task. Nevertheless, the fact that the parent-directed segment of the interaction task was specifically designed to have parents initiating the shift in focus from a child-directed to parent-directed focus, suggests that the higher levels of observed maternal control behavior with boys may have preceded the increase in child negative behavior. Similarly, Maccoby (1992) has argued that although the normal socialization process involves an evolving system of reciprocity, mothers nevertheless are the more powerful agents in the early stages of establishing this system of reciprocity. This argument supports the notion that maternal control behavior preceded the child negative behavior observed during the parent-child interaction task of the present study. However, more refined measures of sequential parent-child interaction would have been necessary to accurately assess the timing and precise nature of this relationship (Kochanska, 1997; Kuczynski et al., 1987;

Rocissano, Slade & Lynch, 1987). Regardless of the key mechanism of influence, the results clearly suggest that mothers of boys with more severe ROM histories were not able to effectively match their style of interaction to the child's attentional or emotional state in such a manner that would result in a more harmonious interaction (Baumrind, 1988; Kochanska, 1997; Kuczynski et al., 1987; Maccoby, 1983, 1992).

It is interesting to note that the overall set of findings for father-child interactions were very different from mother-child interactions and generally not consistent with the hypotheses. The paucity of significant findings for father-child interactions is especially interesting given the popularly held notion that fathers may be becoming more involved in the lives of their children (Furstenberg, 1988; Marsiglio, 1995). However, contemporary research examining the various complexities of paternal involvement, beyond the more proximal sphere of parent-child interactions, have begun to identify and study a wide variety of types of paternal involvement (Lamb, 1997; Lamb, Pleck, Charnov & Levine, 1987; Palkovitz, 1997; Pleck, Lamb & Levine, 1986). This recent research suggests that mothers continue to play a more central role in the lives of their children, especially with respect to the more proximal parent-child relationship issues (Bloom-Feshbach, 1981; Lamb, 1997; Lamb et al., 1987; Maccoby, 1992; Pleck et al., 1986), and as such are more likely to be directly affected by the negative impact of illnesses such as recurrent ROM. In a review of the literature, Lamb et al. (1987) found that although fathers do appear to be spending considerably more time interacting with their children when mothers are employed, the proportionate increase in the amount of time spent in interactions was largely accounted for by a decrease in the amount of actual time that mothers were available to interact with their children. Thus, it is clear that future research in this area is

greatly needed and may help to explicate the heretofore elusive processes underlying the popularly held notion of increased involvement of fathers in the lives of their children.

In summary, the results provided little support for the "independent influence" model. In general, a history of ROM predicted neither children's negative behavior, nor parental warmth or control during the parent-child interaction task. There was, however, some support found for the "buffering" model in that the results suggest style of parental interactive behavior may moderate the relationship between ROM and child behavior problems; however the findings were not always in the predicted direction. In particular, 1) ROM severity interacted with maternal warmth, and 2) ROM severity interacted with maternal control and child sex in predicting child negative behavior during the structured, laboratory play task. These results add to the findings from several other recent studies on otitis media, which have documented the key role that parent behavior plays in moderating the negative effects of ROM on children's development (Roberts et al., 1995; Wallace, Gravel, Schwartz & Ruben, 1996).

Wallace et al. (1996) investigated the association between early otitis media, style of parental interaction behavior and children's language development. The results of the study show that high maternal verbal stimulation was associated with better language skills, whereas high levels of observed maternal control behavior during a laboratory interaction task were associated with low scores on measures of expressive language development. In a related prospective longitudinal study of 61 infants, Roberts et al. (1995) found an association between otitis media and subsequent hearing loss, language and cognitive outcomes, but only when parenting style and quality of the home environments were taken into account. Both of these earlier studies, as well as the present

study, underscore the important moderating role that family factors, such as parental interaction style, play in minimizing the impact of otitis media on children's development.

On the one hand, the findings suggest that increased maternal warmth may have been utilized by mothers to offset the negative effects of a history of ROM by providing additional supportive guidance, prior to the emergence of any child negative behavior or in response to such deviant behavior. On the other hand, higher levels of maternal control may have been utilized as an attempt to regulate the play activity (which was more successful for girls versus boys with more severe ROM histories), either before and/or after the emergence of child negative behavior. It is clear from the results of the present study that future studies must continue to explore the potential dynamic between parental warmth and control as a buffering mechanism against the deleterious effects of recurrent otitis media. However, future research also will need to address several of the key limitations to the present study.

Limitations of the Present Study

Several notes of caution should be offered regarding the results of the present study. First, the sample size was relatively small (n=56), thereby limiting the power to detect anything but large effects. Cell sizes associated with analyses attempting to examine the three-way interaction between ROM severity and parental warmth and control obviously were especially small. Future research efforts should utilize much larger samples of children, with representative sampling of all age groups between the ages of birth to at least 6-years, in order to better support these types of statistical analyses. This need to conduct studies with larger and more representative samples is particularly important given that other researchers (e.g., Casey, 1983; Daly, 1991; Paradise, 1981;

Roberts et al., 1994; Teele et al, 1989) have documented that the negative effects of ROM may be greatest during the first few years of life.

Second, as was mentioned earlier, the actual severity of ROM history was a second factor that may have influenced the results of the present study. The mean number of episodes of ROM in the present study was relatively low (4.18 episodes across the first three years of life), compared to the levels found in most other study samples. The fact that other related studies have included children with more severe early histories of ROM could explain why they found strong relationships between ROM severity and parent and/or child behavioral difficulties. Conversely, given that the children in the present study experienced fewer episodes of ROM than the participants in many of the earlier related studies, the potential negative effects of ROM on behavioral adjustment might have been less severe and thereby less observable, than was otherwise expected.

Third, the sample consisted of children from well-educated, middle-class families. Other studies (e.g., Roberts et al., 1995; Wallace, Gravel, Schwartz & Ruben, 1996), utilized samples that either were more varied on SES or included a higher number of lower income families. Higher educated, middle class parents are likely to have more available resources and hence better parenting skills, than the general population, which also translates into reduced vulnerability to stresses associated with childhood illnesses. Given that the participants were representative of a higher functioning group of families, who regularly seek medical care for their children's physical ailments, the potential negative impact of illnesses on their children's emotional and behavioral functioning likely was minimized. Future studies should include larger samples with enough variability in SES to allow for greater generalizability of the findings.

Fourth, the cross-sectional design of the present study severely limits the ability to determine causality among the variables of interest. More specifically, the study did not utilize a prospective, longitudinal design that would allow for a more precise examination of the multiple effects of ROM on children's developmental trajectories over time, as have other related studies (e.g., Roberts et al., 1995; Vernon-Feagans, Manlove & Volling, 1996; Wallace, Gravel, Schwartz & Ruben, 1996). Similarly, the cross-sectional design of the study did not allow for the observation of whether parental behavior fluctuated in response to the effects of ROM episodes on their children's behavior, over time. Thus, it would be important for future studies to include longitudinal designs to examine prospectively the impact of ROM on childhood development over a significant period of time.

Fifth, the actual documentation of ROM history in the present study was based primarily on medical record review, rather than on a more direct assessment over time, via otoscopy, tympanometry, auditory brain stem assessments, or other calibrated physical assessment approaches (e.g., Roberts et al., 1995; Teele et al., 1990; Vernon-Feagans, Manlove & Volling, 1996; Wallace, Gravel, Schwartz & Ruben, 1996). Many of these other recent studies relied on one or more of the more direct assessment methods and often conducted the assessments on a regular basis over the course of the study. Thus, the resulting ROM severity index used in the present study, likely was much less precise than those used in other studies, and thereby less likely to allow the detection of small effects.

Sixth, the participants were not evaluated for the potential presence of conductive hearing loss, which has been shown to be related to both a history of ROM and increased behavioral difficulties (e.g., Baldwin, 1993; Bluestone et al., 1983; Gottlieb, Zinkus, &

Thompson, 1979; Mattison, Cantwell & Baker, 1980; Roberts et al, 1995). Although the parent-child interaction sessions were conducted when children were not experiencing an acute episode of otitis media, actual hearing assessments were not conducted prior to their participation in the observational sessions. Thus, it was not possible to determine whether any of the children were experiencing any actual hearing loss at the time the observed parent-child interaction sessions were conducted. Although the presence of conductive hearing loss at the time of observation might be expected to result in more negative child behavior, it nevertheless presents a potential confounding factor, especially if the hearing loss were to occur in children with less severe ROM histories. Thus, the optimal situation would be to ensure that children being observed were not experiencing any temporary hearing loss at the time of observation.

A seventh limitation of the present study was that a comprehensive evaluation of other potential situational stressors was not conducted due to the necessarily limited scope of the present study. It is acknowledged that behavioral and interactional problems are often multiply determined, and as such, the reported findings may have been influenced by additional variables, such as the parent's level of perceived stress, marital difficulties, and financial difficulties, among others. Therefore, in future studies it will be necessary to replicate the present findings while considering the influence of other potential stressors on the parent-child relationship.

The eighth limitation of the present investigation was that the particular interaction task used may not have been long enough or naturalistic enough to elicit an adequate range of behavior, including more significant dysfunctional parent-child interactions as well as more responsive and nurturing interactions. The relatively low frequency of

parent and child behaviors in general, and negative behavior in particular, in each of the individual interaction segments made it more difficult to examine the complexity of relationships among parental warmth and control and child negative behavior, especially as a function of varying ROM histories. Although the findings provided partial support for several of the hypotheses, and represent a contribution to the existing literature on the impact of ROM on children's development, it is possible that the results may have been more robust with a longer and more varied interaction task.

A ninth limitation of the present study was related to the internal consistency of the parental warmth scale. For both mothers and fathers, although the overall parental warmth scale exhibited adequate internal consistency, there was poor internal consistency in the parent-directed segment, which improved only slightly in the clean-up segment. This poor internal consistency likely was a result of the low rate of occurrence of the behaviors within the parental warmth scale during the parent-directed segment. Alternatively, within the different tasks, the meaning and structure of the scale may change as a function of the unique context of the situation. In either case, this limitation reduced the level of confidence that the underlying construct of parental warmth actually was being measured.

A final limitation was the way in which parental control was defined in the present study. Although the initial intent was to draw upon the socialization literature and define two distinct sub-scales of parental control behaviors, a "positive" control scale and a "negative" control scale, preliminary analyses did not support this approach. Rather, as noted earlier, individual parental control behaviors were best subsumed under a single parental control scale, which differed somewhat for mothers and fathers. Careful

examination of the categories of behavior that were included in the parental control scale further indicated that the resulting scale used in the present study may have been more heavily weighted towards the "negative" side of parental control, especially for mothers. This assertion is based on the observation that a majority of the parental behaviors included in the control scale (e.g., negative commands, direct and indirect commands with no opportunity to comply, and for mothers but not fathers, critical statements, and physically negative behavior) all were initially subsumed under the "negative" control dimension based on a review of the clinical literature. Thus, it was not possible to examine whether a combination of parental warmth and "positive" parental control would provide the most effective buffering mechanism against the deleterious effects of ROM on children's adjustment.

Summary

In summary, there were several important findings from the present study, which represent contributions to the existing literature on the impact of ROM on children and their families. The most interesting and consistent findings in some ways support the "buffering" model in that the results suggest style of parental interactive behavior may moderate the relationship between ROM and child behavior problems. In particular, the interactions between 1) ROM severity and maternal warmth, and 2) ROM severity, maternal control and child sex, in predicting child negative behavior during the structured, laboratory play task support the assertion that parents are in the unique position to moderate the potentially deleterious effects of ROM on a child's emotional and behavioral adjustment.

Given that certain illnesses such as ROM have been found to be associated with increases in child behavior problems and disruptions in parent-child relationships, there are several important implications for the current set of findings. The most important implication is that it may be most fruitful for future research efforts to examine what specific factors enable some parents of children with severe ROM histories to successfully adjust their interaction style to best match variations in situational demands and their children's temperament.

As was shown in the earlier review of the literature, there are clear advantages to utilizing different styles of parenting, depending upon certain child characteristics and situational circumstances. If a parent is sensitive to the child's needs, able to convey warmth, and able to synchronize attempts to direct or control the child's behavior with the child's age and temperamental state, then the likelihood of obtaining compliance and maximizing the child's behavioral and emotional development should be significantly increased (Kochanska, 1997; Maccoby, 1983, 1992; Marfo, 1990; Martin, 1987; Rocisano, Slade, & Lynch, 1987; Schaffer & Crook, 1980). While the results of the present study did not specifically support the importance of the combination of parental warmth and control, the results nevertheless did suggest that certain aspects of parental interactive behavior may moderate the relationship between ROM and child behavior problems.

More generally, this and other studies indicate that health care providers will need to become more aware of the multiple factors that determine the impact an illness such as ROM may have on a children's emotional and behavioral adjustment, especially given that parents' qualities may moderate effects of illness on the child's psychosocial adjustment.

Thus, these providers are coming to recognize that they can no longer can assess and/or treat the impact of ROM in isolation and need to consider such issues as the availability of family resources, overall family functioning, and parent's abilities to compensate for the effects of the illness over time.

APPENDIX A

Table 3. Interrater reliabilities for frequency ratings of individual sets of coded videotapes[a].

	Overall	Child-directed	Parent-directed	Clean-up
1.	K = .77	K = .62	K = .83	K = .56
2.	K = .85	K = .73	K = .76	K = .56
3.	K = .72	K = .60	K = .71	K = .63
4.	K = .77	K = .73	K = .62	K = .67
5.	K = .65	K = .71	K = .44	K = .41
6.	K = .63	K = .41	K = .49	K = .50
7.	K = .65	K = .69	K = .62	K = .53
8.	K = .75	K = .65	K = .74	K = .55
9.	K = .73	K = .68	K = .69	K = .65
10.	K = .68	K = .59	K = .63	K = .35
11.	K = .72	K = .63	K = .55	K = .69
12.	K = .76	K = .60	K = .66	K = .67
13.	K = .77	K = .59	K = .70	K = .79
14.	K = .64	K = .63	K = .55	K = .72
15.	K = .59	K = .65	K = .48	K = .65

[a] Interrater reliabilities were calculated on 29 sets of frequency ratings, with each set of ratings conducted by a randomly selected pair of two of four trained coders. Each set of frequency ratings was conducted across the three separate task segments using the nineteen individual child and parent behaviors and the kappas presented are for the overall interrater reliabilities, as well as separate reliabilities for each task segment.

Table 3 (cont'd).

16.	K = .78	K = .90	K = .82	K = .53
17.	K = .82	K = .75	K = .79	K = .69
18.	K = .82	K = .68	K = .81	K = .70
19.	K = .73	K = .56	K = .80	K = .62
20.	K = .78	K = .89	K = .76	K = .76
21.	K = .66	K = .67	K = .61	K = .66
22.	K = .69	K = .78	K = .70	K = .60
23.	K = .83	K = .85	K = .80	K = .60
24.	K = .82	K = .74	K = .74	K = .74
25.	K = .75	K = .74	K = .68	K = .68
26.	K = .79	K = .67	K = .72	K = .79
27.	K = .70	K = .57	K = .69	K = .63
28.	K = .75	K = .73	K = .78	K = .60
29.	K = .72	K = .75	K = .72	K = .44
	Mean = .73	Mean = .76	Mean = .74	Mean = .69

APPENDIX B

Table 4. Internal consistency of parent & child behavior scales.

	Mothers		Fathers	
Total - Parent Warmth	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Descriptive/Reflective	.35	.37	.40	.52
Descriptive Statements	.49	.24	.46	.40
Reflective Statements	.27	.50	.47	.55
Acknowledgements	.17	.52	.40	.47
Praise	.32	.45	.35	.53
	Alpha = .50		Alpha = .56	
Child directed - Parent Warmth				
Descriptive/Reflective Questions	.38	.59	.49	.76
Descriptive Statements	.72	.37	.80	.58
Reflective Statements	.72	.37	.80	.58
Acknowledgements	.01	.73	.30	.76
Praise	.26	.65	.36	.76
	Alpha = .63		Alpha = .74	

Table 4. (cont'd).

	Mothers		Fathers	
	Item-Total	Alpha If Item	Item-Total	Alpha If Item
Parent directed - Parent Warmth	Correlation	Deleted	Correlation	Deleted
Descriptive/Reflective Questions	.02	.03	.08	.29
Descriptive Statements	.01	.05	.10	.20
Reflective Statements	-.05	.06	.23	.20
Acknowledgements	-.04	.11	.23	.10
Praise	.18	-.07	.18	.18
	Alpha = .05		Alpha = .22	
Clean up - Parent Warmth				
Descriptive/Reflective Questions	.30	.17	.31	.35
Descriptive Statements	.33	.11	.31	.36
Reflective Statements	.15	.33	.27	.47
Acknowledgements	.08	.33	.25	.40
Praise	.12	.31	.30	.40
	Alpha = .33		Alpha = .46	

Table 4. (cont'd).

	Mothers		Fathers	
Total - Parent Control	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Critical Statements	.44	.03	--	--
Physical Negative	.21	.05	--	--
Direct Commands	.42	.62	.46	.56
Direct Commands/ No opportunity	.55	.60	.59	.49
Indirect Commands - No opportunity	.42	.62	.37	.65
Negative Commands	.57	.55	.38	.62
	Alpha = .67		Alpha = .65	

Table 4. (cont'd).

	Mothers		Fathers	
Child directed - Parent Control	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Critical Statements	.48	.49	--	--
Physical Negative	.00	.60	--	--
Direct Commands	.34	.59	.40	.35
Direct Commands/ No opportunity	.52	.45	.37	.42
Indirect Commands - No opportunity	.34	.52	.31	.42
Negative Commands	.41	.51	.31	.47
	Alpha = .57		Alpha = .50	

Table 4. (cont'd).

	Mothers		Fathers	
Parent directed - Parent Control	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Critical Statements	.31	.66	--	--
Physical Negative	.50	.69	--	--
Direct Commands	.49	.60	.30	.52
Direct Commands - No opportunity	.62	.59	.46	.39
Indirect Commands - No opportunity	.53	.62	.30	.55
Negative Commands	.51	.61	.48	.47
	Alpha = .67		Alpha = .55	

Table 4. (cont'd).

	Mothers		Fathers	
Clean up - Parent Control	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Critical Statements	.30	.54	--	--
Physical Negative	.11	.57	--	--
Direct Commands	.41	.46	.34	.34
Direct Commands/ No opportunity	.27	.52	.36	.36
Indirect Commands - No opportunity	.32	.50	.26	.46
Negative Commands	.49	.40	.26	.46
	Alpha = .55		Alpha = .48	

Table 4. (cont'd).

	Mothers		Fathers	
Total – Child Negative Behavior	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Cry - Ignored	.40	.55	.40	.56
Cry - Responded to	.47	.49	.68	.53
Yell - Ignored	.07	.59	.00	.62
Yell - Responded	.22	.58	.54	.56
Whine - Ignored	.37	.57	.58	.57
Whine - Responded	.56	.45	.40	.57
Smart talk - Ignored	-.07	.59	.00	.62
Smart talk - Responded	.20	.63	.30	.65
Destructive Action - Ignored	.49	.58	.63	.60
Destructive Action - Responded	.51	.49	.87	.59
Child Physical Negative - Ignored	.07	.59	.00	.62
Child Physical Negative - Responded	.21	.58	-.06	.62
	Alpha = .58		Alpha = .61	

Table 4. (cont'd).

	Mothers		Fathers	
Child directed - Child Neg. Behavior[a]	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Cry - Ignored	--	--	--	--
Cry - Responded to	--	--	--	--
Yell - Ignored	--	--	--	--
Yell - Responded	--	--	--	--
Whine - Ignored	--	--	--	--
Whine - Responded	--	--	--	--
Smart talk - Ignored	--	--	--	--
Smart talk - Responded	--	--	--	--
Destructive Action - Ignored	--	--	--	--
Destructive Action - Responded	--	--	--	--
Child Physical Negative - Ignored	--	--	--	--
Child Physical Negative - Responded	--	--	--	--
	Alpha = --		Alpha = --	

[a] Child Problem behaviors rarely occurred so that alphas could not be computed.

Table 4. (cont'd).

	Mothers		Fathers	
Parent directed - Child Neg. Behavior[b,c]	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Cry - Ignored	.00	.69	.00	.38
Cry - Responded	.88	.59	.04	.38
Yell - Ignored	.06	.69	.00	.38
Yell - Responded	.51	.67	.64	.33
Whine - Ignored	.06	.69	.00	.38
Whine - Responded	.74	.58	.28	.27
Smart talk - Ignored	-.05	.69	.00	.38
Smart talk - Responded	.49	.63	.44	.16
Destructive Action - Ignored	.00	.69	.00	.38
Destructive Action - Responded	.70	.57	.61	.28
Child Physical Negative - Ignored	.06	.69	.00	.38
Child Physical Negative - Responded	.06	.69	-.06	.38
	Alpha = .69		Alpha = .37	

[b] Child initiated crying and destructive behavior did not occur during the mother directed task.

[c] Child initiated crying, yelling, whining, smart talk, destructive behavior, and physical negative behaviors did not occur during the father directed task.

Table 4. (cont'd).

	Mothers		Fathers	
Clean up - Child Negative Behavior[d]	Item-Total Correlation	Alpha If Item Deleted	Item-Total Correlation	Alpha If Item Deleted
Cry - Ignored	.67	.40	.56	.60
Cry - Responded to	.49	.40	.83	.56
Yell - Ignored	.00	.53	.00	.67
Yell - Responded	-.02	.53	.40	.64
Whine - Ignored	.68	.48	.73	.60
Whine - Responded	.47	.41	.40	.63
Smart talk - Ignored	.00	.53	.00	.67
Smart talk - Responded	.07	.62	.23	.69
Destructive Action - Ignored	.75	.50	.77	.65
Destructive Action - Responded	.21	.51	.77	.65
Child Physical Negative - Ignored	.00	.53	.00	.67
Child Physical Negative - Responded	.42	.51	.00	.67
	Alpha = .52		Alpha = .67	

[d] Child initiated yelling, smart talk, and physical negative behavior did not occur during clean up with mothers or fathers and child responding physical negative behavior did not occur during clean up with fathers.

APPENDIX C

Table 7. Correlations among child and parent variables

	AGE MOS.	CHILD SEX	FATHER ED.	MOTHER ED.	ROM	MWARMTH
AGE MOS.	1.0000 (n = 56) p= .	0.1004 (n = 56) p= .462	-0.0428 (n = 56) p= .754	-0.1637 (n = 56) p= .228	-0.0814 (n = 53) p= .562	-0.0965 (n = 55) p= .483
CHILD SEX	0.1004 (n = 56) p= .462	1.0000 (n = 56) p= .	0.1265 (n = 56) p= .353	0.0788 (n = 56) p= .564	0.1063 (n = 53) p= .449	0.1624 (n = 55) p= .236
FATHER ED.	-0.0428 (n = 56) p= .754	0.1265 (n = 56) p= .353	1.0000 (n = 56) p= .	0.4766 (n = 56) p= .000	0.11 (n = 53) p= .433	0.1736 (n = 55) p= .205
MOTHER ED.	-0.1637 (n = 56) p= .228	0.0788 (n = 56) p= .564	0.4766 (n = 56) p= .000	1.0000 (n = 56) p= .	0.1664 (n = 53) p= .234	0.1892 (n = 55) p= .166
ROM	-0.0814 (n = 53) p= .562	0.1063 (n = 53) p= .449	0.11 (n = 53) p= .433	0.1664 (n = 53) p= .234	1.0000 (n = 53) p= .	0.1783 (n = 52) p= .206
MWARMTH	-0.0965 (n = 55) p= .483	0.1624 (n = 55) p= .236	0.1736 (n = 55) p= .205	0.1892 (n = 55) p= .166	0.1783 (n = 52) p= .206	1.0000 (n = 55) p= .

Table 7. (cont'd)

	AGE MOS.	CHILD SEX	FATHER ED.	MOTHER ED.	ROM	MWARMTH
MWARMCDR	-0.0737 (n = 55) p= .593	0.2318 (n = 55) p= .089	0.0145 (n = 55) p= .916	0.033 (n = 55) p= .811	0.1925 (n = 52) p= .172	0.7008 (n = 55) p= .000
MWARMDR	-0.0409 (n = 55) p= .767	0.2341 (n = 55) p= .085	0.1887 (n = 55) p= .168	0.2226 (n = 55) p= .102	0.2123 (n = 52) p= .131	0.7041 (n = 55) p= .000
MWARMCUR	-0.1074 (n = 54) p= .440	-0.1951 (n = 54) p= .158	0.1643 (n = 54) p= .235	0.1965 (n = 54) p= .154	0.0778 (n = 51) p= .587	0.7103 (n = 54) p= .000
MCONTROL	0.0154 (n = 55) p= .911	0.1903 (n = 55) p= .164	-0.0212 (n = 55) p= .878	0.0753 (n = 55) p= .585	0.1722 (n = 52) p= .222	0.0031 (n = 55) p= .982
MCONTLCD	-0.0351 (n = 55) p= .799	0.0793 (n = 55) p= .565	-0.1259 (n = 55) p= .360	0.1171 (n = 55) p= .395	-0.0504 (n = 52) p= .723	0.0468 (n = 55) p= .735
MCONTLDR	0.0566 (n = 55) p= .682	0.1912 (n = 55) p= .162	0.0257 (n = 55) p= .852	0.0411 (n = 55) p= .766	0.2183 (n = 52) p= .120	0.0888 (n = 55) p= .519
MCONTLCU	0.0223 (n = 54) p= .873	0.1604 (n = 54) p= .247	0.0401 (n = 54) p= .773	0.0729 (n = 54) p= .600	0.0808 (n = 51) p= .573	-0.0561 (n = 54) p= .687

	AGE MOS.	CHILD SEX	FATHER ED.	MOTHER ED.	ROM	MWARMTH
FWARMTH	0.0188 (n = 55) p= .892	-0.3072 (n = 55) p= .023	0.3431 (n = 55) p= .010	0.0755 (n = 55) p= .584	-0.0844 (n = 52) p= .552	-0.0723 (n = 55) p= .600
FWARMCDR	-0.0352 (n = 55) p= .799	-0.374 (n = 55) p= .005	0.1413 (n = 55) p= .303	-0.0694 (n = 55) p= .615	-0.1017 (n = 52) p= .473	-0.112 (n = 55) p= .416
FWARMDR	-0.0027 (n = 55) p= .984	-0.1621 (n = 55) p= .237	0.4393 (n = 55) p= .001	0.1708 (n = 55) p= .212	0.0418 (n = 52) p= .768	0.0967 (n = 55) p= .482
FWARMCUR	0.0418 (n = 55) p= .762	-0.1926 (n = 55) p= .159	0.3253 (n = 55) p= .015	0.0796 (n = 55) p= .563	-0.0252 (n = 52) p= .859	-0.0093 (n = 55) p= .947
FCONTROL	-0.1751 (n = 55) p= .201	-0.0802 (n = 55) p= .561	0.018 (n = 55) p= .896	0.1752 (n = 55) p= .201	0.0806 (n = 52) p= .570	-0.0842 (n = 55) p= .541
FCONTLCD	-0.1444 (n = 55) p= .293	-0.0672 (n = 55) p= .626	0.1053 (n = 55) p= .444	0.2047 (n = 55) p= .134	0.0571 (n = 52) p= .687	0.0726 (n = 55) p= .598
FCONTLDR	-0.1733 (n = 55) p= .206	-0.0995 (n = 55) p= .470	-0.0279 (n = 55) p= .840	0.0921 (n = 55) p= .503	0.0852 (n = 52) p= .548	-0.0303 (n = 55) p= .826

	AGE MOS.	CHILD SEX	FATHER ED.	MOTHER ED.	ROM	MWARMTH
FCONTLCU	-0.049 (n = 55) p= .723	0.014 (n = 55) p= .919	0.0668 (n = 55) p= .628	0.1673 (n = 55) p= .222	0.005 (n = 52) p= .972	-0.061 (n = 55) p= .658
CNBMR	-0.0761 (n = 55) p= .581	-0.0152 (n = 55) p= .912	0.0905 (n = 55) p= .511	0.224 (n = 55) p= .100	0.2129 (n = 52) p= .130	0.0199 (n = 55) p= .885
CNBMCDR	-0.1975 (n = 55) p= .148	0.132 (n = 55) p= .337	0.1266 (n = 55) p= .357	0.2324 (n = 55) p= .088	0.2799 (n = 52) p= .044	0.2682 (n = 55) p= .048
CNBMDR	-0.1773 (n = 55) p= .195	0.2337 (n = 55) p= .086	0.1892 (n = 55) p= .166	0.1842 (n = 55) p= .178	0.2084 (n = 52) p= .138	0.0662 (n = 55) p= .631
CNBMCUR	-0.0759 (n = 54) p= .585	-0.2299 (n = 54) p= .094	-0.0448 (n = 54) p= .748	0.2081 (n = 54) p= .131	0.1124 (n = 51) p= .432	0.0169 (n = 54) p= .903
CNBFR	-0.2776 (n = 55) p= .040	0.0291 (n = 55) p= .833	-0.0306 (n = 55) p= .825	0.175 (n = 55) p= .201	-0.0291 (n = 52) p= .838	-0.0773 (n = 55) p= .575
CNBFCDR	0.0577 (n = 55) p= .676	-0.1336 (n = 55) p= .331	0.0327 (n = 55) p= .813	-0.0507 (n = 55) p= .713	0.0183 (n = 52) p= .897	-0.2898 (n = 55) p= .032

	AGE MOS.	CHILD SEX	FATHER ED.	MOTHER ED.	ROM	MWARMTH
CNBFDR	-0.3834 (n = 55) p= .004	0.07 (n = 55) p= .611	0.0803 (n = 55) p= .560	0.3652 (n = 55) p= .006	-0.1067 (n = 52) p= .451	-0.0608 (n = 55) p= .659
CNBFCUR	-0.1969 (n = 55) p= .150	0.0189 (n = 55) p= .891	-0.0622 (n = 55) p= .652	0.0274 (n = 55) p= .843	-0.0127 (n = 52) p= .929	-0.0391 (n = 55) p= .777

	MWARMCDR	MWARMDR	MWARMCUR	MCONTROL	MCONTLCD	MCONTLDR
AGE MOS.	-0.0737 (n = 55) p= .593	-0.0409 (n = 55) p= .767	-0.1074 (n = 54) p= .440	0.0154 (n = 55) p= .911	-0.0351 (n = 55) p= .799	0.0566 (n = 55) p= .682
CHILD SEX	0.2318 (n = 55) p= .089	0.2341 (n = 55) p= .085	-0.1951 (n = 54) p= .158	0.1903 (n = 55) p= .164	0.0793 (n = 55) p= .565	0.1912 (n = 55) p= .162
FATHER ED.	0.0145 (n = 55) p= .916	0.1887 (n = 55) p= .168	0.1643 (n = 54) p= .235	-0.0212 (n = 55) p= .878	-0.1259 (n = 55) p= .360	0.0257 (n = 55) p= .852
MOTHER ED.	0.033 (n = 55) p= .811	0.2226 (n = 55) p= .102	0.1965 (n = 54) p= .154	0.0753 (n = 55) p= .585	0.1171 (n = 55) p= .395	0.0411 (n = 55) p= .766

	MWARMCDR	MWARMDR	MWARMCUR	MCONTROL	MCONTLCD	MCONTLDR
ROM	0.1925 (n = 52) p= .172	0.2123 (n = 52) p= .131	0.0778 (n = 51) p= .587	0.1722 (n = 52) p= .222	-0.0504 (n = 52) p= .723	0.2183 (n = 52) p= .120
MWARMTH	0.7008 (n = 55) p= .000	0.7041 (n = 55) p= .000	0.7103 (n = 54) p= .000	0.0031 (n = 55) p= .982	0.0468 (n = 55) p= .735	0.0888 (n = 55) p= .519
MWARMCDR	1.0000 (n = 55) p= .	0.3016 (n = 55) p= .025	0.318 (n = 54) p= .019	-0.0112 (n = 55) p= .935	0.2578 (n = 55) p= .057	-0.0144 (n = 55) p= .917
MWARMDR	0.3016 (n = 55) p= .025	1.0000 (n = 55) p= .	0.4418 (n = 54) p= .001	-0.0497 (n = 55) p= .719	-0.1357 (n = 55) p= .323	0.0886 (n = 55) p= .520
MWARMCUR	0.318 (n = 54) p= .019	0.4418 (n = 54) p= .001	1.0000 (n = 54) p= .	-0.1041 (n = 54) p= .454	-0.1362 (n = 54) p= .326	-0.026 (n = 54) p= .852
MCONTROL	-0.0112 (n = 55) p= .935	-0.0497 (n = 55) p= .719	-0.1041 (n = 54) p= .454	1.0000 (n = 55) p= .	0.4045 (n = 55) p= .002	0.8707 (n = 55) p= .000
MCONTLCD	0.2578 (n = 55) p= .057	-0.1357 (n = 55) p= .323	-0.1362 (n = 54) p= .326	0.4045 (n = 55) p= .002	1.0000 (n = 55) p= .	0.2196 (n = 55) p= .107

	MWARMCDR	MWARMDR	MWARMCUR	MCONTROL	MCONTLCD	MCONTLDR
MCONTLDR	-0.0144 (n = 55) p= .917	0.0886 (n = 55) p= .520	-0.026 (n = 54) p= .852	0.8707 (n = 55) p= .000	0.2196 (n = 55) p= .107	1.0000 (n = 55) p= .
MCONTLCU	-0.1064 (n = 54) p= .444	-0.0673 (n = 54) p= .629	-0.041 (n = 54) p= .768	0.6874 (n = 54) p= .000	0.1192 (n = 54) p= .391	0.4012 (n = 54) p= .003
FWARMTH	-0.1228 (n = 55) p= .372	-0.0503 (n = 55) p= .716	0.0501 (n = 54) p= .719	-0.2181 (n = 55) p= .110	-0.1911 (n = 55) p= .162	-0.2237 (n = 55) p= .101
FWARMCDR	0.0005 (n = 55) p= .997	-0.1649 (n = 55) p= .229	-0.0134 (n = 54) p= .923	-0.2655 (n = 55) p= .050	-0.04 (n = 55) p= .772	-0.3252 (n = 55) p= .015
FWARMDR	-0.1225 (n = 55) p= .373	0.2225 (n = 55) p= .102	0.1935 (n = 54) p= .161	-0.227 (n = 55) p= .096	-0.339 (n = 55) p= .011	-0.1614 (n = 55) p= .239
FWARMCUR	-0.042 (n = 55) p= .761	-0.0035 (n = 55) p= .980	0.0404 (n = 54) p= .772	-0.038 (n = 55) p= .783	0.0094 (n = 55) p= .946	-0.0645 (n = 55) p= .640
FCONTROL	0.0469 (n = 55) p= .734	-0.144 (n = 55) p= .294	-0.1158 (n = 54) p= .404	0.3556 (n = 55) p= .008	0.2183 (n = 55) p= .109	0.3414 (n = 55) p= .011

	MWARMCDR	MWARMDR	MWARMCUR	MCONTROL	MCONTLCD	MCONTLDR
FCONTLCD	0.1674 (n = 55) p= .222	-0.1087 (n = 55) p= .429	0.0015 (n = 54) p= .992	-0.0544 (n = 55) p= .693	-0.0486 (n = 55) p= .725	-0.0523 (n = 55) p= .704
FCONTLDR	0.0632 (n = 55) p= .646	-0.0557 (n = 55) p= .686	-0.044 (n = 54) p= .752	0.2596 (n = 55) p= .056	0.2336 (n = 55) p= .086	0.291 (n = 55) p= .031
FCONTLCU	0.0849 (n = 55) p= .538	-0.1378 (n = 55) p= .316	-0.1899 (n = 54) p= .169	0.4219 (n = 55) p= .001	0.2397 (n = 55) p= .078	0.3345 (n = 55) p= .013
CNBMR	-0.0876 (n = 55) p= .525	0.0849 (n = 55) p= .538	-0.002 (n = 54) p= .988	0.4886 (n = 55) p= .000	-0.0797 (n = 55) p= .563	0.4457 (n = 55) p= .001
CNBMCDR	0.0183 (n = 55) p= .894	0.4175 (n = 55) p= .002	0.0769 (n = 54) p= .581	0.2502 (n = 55) p= .065	0.1316 (n = 55) p= .338	0.2156 (n = 55) p= .114
CNBMDR	-0.1068 (n = 55) p= .438	0.0295 (n = 55) p= .831	0.0511 (n = 54) p= .714	0.6804 (n = 55) p= .000	0.008 (n = 55) p= .954	0.6599 (n = 55) p= .000
CNBMCUR	-0.0106 (n = 54) p= .939	0.05 (n = 54) p= .719	0.0798 (n = 54) p= .566	0.1309 (n = 54) p= .345	-0.1436 (n = 54) p= .300	0.0965 (n = 54) p= .488

	MWARMCDR	MWARMDR	MWARMCUR	MCONTROL	MCONTLCD	MCONTLDR
CNBFR	-0.1759 (n = 55) p= .199	0.0333 (n = 55) p= .809	-0.1068 (n = 54) p= .442	0.0035 (n = 55) p= .980	-0.0324 (n = 55) p= .815	0.0124 (n = 55) p= .928
CNBFCDR	-0.2725 (n = 55) p= .044	-0.256 (n = 55) p= .059	-0.0729 (n = 54) p= .601	-0.1462 (n = 55) p= .287	-0.1173 (n = 55) p= .394	-0.1368 (n = 55) p= .319
CNBFDR	-0.1223 (n = 55) p= .374	-0.1193 (n = 55) p= .386	-0.0793 (n = 54) p= .569	-0.0502 (n = 55) p= .716	0.147 (n = 55) p= .284	-0.0866 (n = 55) p= .530
CNBFCUR	-0.1391 (n = 55) p= .311	0.1084 (n = 55) p= .431	-0.0961 (n = 54) p= .490	-0.0175 (n = 55) p= .899	-0.1082 (n = 55) p= .432	-0.0003 (n = 55) p= .998

	MCONTLCU	FWARMTH	FWARMCDR	FWARMDR	FWARMCUR	FCONTROL
AGE MOS.	0.0223 (n = 54) p= .873	0.0188 (n = 55) p= .892	-0.0352 (n = 55) p= .799	-0.0027 (n = 55) p= .984	0.0418 (n = 55) p= .762	-0.1751 (n = 55) p= .201
CHILD SEX	0.1604 (n = 54) p= .247	-0.3072 (n = 55) p= .023	-0.374 (n = 55) p= .005	-0.1621 (n = 55) p= .237	-0.1926 (n = 55) p= .159	-0.0802 (n = 55) p= .561

	MCONTLCU	FWARMTH	FWARMCDR	FWARMDR	FWARMCUR	FCONTROL
FATHER ED.	0.0401 (n = 54) p= .773	0.3431 (n = 55) p= .010	0.1413 (n = 55) p= .303	0.4393 (n = 55) p= .001	0.3253 (n = 55) p= .015	0.018 (n = 55) p= .896
MOTHER ED.	0.0729 (n = 54) p= .600	0.0755 (n = 55) p= .584	-0.0694 (n = 55) p= .615	0.1708 (n = 55) p= .212	0.0796 (n = 55) p= .563	0.1752 (n = 55) p= .201
ROM	0.0808 (n = 51) p= .573	-0.0844 (n = 52) p= .552	-0.1017 (n = 52) p= .473	0.0418 (n = 52) p= .768	-0.0252 (n = 52) p= .859	0.0806 (n = 52) p= .570
MWARMTH	-0.0561 (n = 54) p= .687	-0.0723 (n = 55) p= .600	-0.112 (n = 55) p= .416	0.0967 (n = 55) p= .482	-0.0093 (n = 55) p= .947	-0.0842 (n = 55) p= .541
MWARMCDR	-0.1064 (n = 54) p= .444	-0.1228 (n = 55) p= .372	0.0005 (n = 55) p= .997	-0.1225 (n = 55) p= .373	-0.042 (n = 55) p= .761	0.0469 (n = 55) p= .734
MWARMDR	-0.0673 (n = 54) p= .629	-0.0503 (n = 55) p= .716	-0.1649 (n = 55) p= .229	0.2225 (n = 55) p= .102	-0.0035 (n = 55) p= .980	-0.144 (n = 55) p= .294
MWARMCUR	-0.041 (n = 54) p= .768	0.0501 (n = 54) p= .719	-0.0134 (n = 54) p= .923	0.1935 (n = 54) p= .161	0.0404 (n = 54) p= .772	-0.1158 (n = 54) p= .404

	MCONTLCU	FWARMTH	FWARMCDR	FWARMDR	FWARMCUR	FCONTROL
MCONTROL	0.6874 (n = 54) p= .000	-0.2181 (n = 55) p= .110	-0.2655 (n = 55) p= .050	-0.227 (n = 55) p= .096	-0.038 (n = 55) p= .783	0.3556 (n = 55) p= .008
MCONTLCD	0.1192 (n = 54) p= .391	-0.1911 (n = 55) p= .162	-0.04 (n = 55) p= .772	-0.339 (n = 55) p= .011	0.0094 (n = 55) p= .946	0.2183 (n = 55) p= .109
MCONTLDR	0.4012 (n = 54) p= .003	-0.2237 (n = 55) p= .101	-0.3252 (n = 55) p= .015	-0.1614 (n = 55) p= .239	-0.0645 (n = 55) p= .640	0.3414 (n = 55) p= .011
MCONTLCU	1.0000 (n = 54) p= .	-0.0501 (n = 54) p= .719	-0.0655 (n = 54) p= .638	-0.0993 (n = 54) p= .475	-0.0288 (n = 54) p= .836	0.2513 (n = 54) p= .067
FWARMTH	-0.0501 (n = 54) p= .719	1.0000 (n = 55) p= .	0.8017 (n = 55) p= .000	0.7119 (n = 55) p= .000	0.813 (n = 55) p= .000	0.098 (n = 55) p= .477
FWARMCDR	-0.0655 (n = 54) p= .638	0.8017 (n = 55) p= .000	1.0000 (n = 55) p= .	0.3249 (n = 55) p= .016	0.6267 (n = 55) p= .000	0.0096 (n = 55) p= .945
FWARMDR	-0.0993 (n = 54) p= .475	0.7119 (n = 55) p= .000	0.3249 (n = 55) p= .016	1.0000 (n = 55) p= .	0.4182 (n = 55) p= .001	0.1113 (n = 55) p= .418

	MCONTLCU	FWARMTH	FWARMCDR	FWARMDR	FWARMCUR	FCONTROL
FWARMCUR	-0.0288 (n = 54) p= .836	0.813 (n = 55) p= .000	0.6267 (n = 55) p= .000	0.4182 (n = 55) p= .001	1.0000 (n = 55) p= .	0.0355 (n = 55) p= .797
FCONTROL	0.2513 (n = 54) p= .067	0.098 (n = 55) p= .477	0.0096 (n = 55) p= .945	0.1113 (n = 55) p= .418	0.0355 (n = 55) p= .797	1.0000 (n = 55) p= .
FCONTLCD	0.0104 (n = 54) p= .941	0.3411 (n = 55) p= .011	0.3736 (n = 55) p= .005	0.2307 (n = 55) p= .090	0.1473 (n = 55) p= .283	0.414 (n = 55) p= .002
FCONTLDR	0.1468 (n = 54) p= .289	-0.0402 (n = 55) p= .771	-0.0837 (n = 55) p= .544	0.0947 (n = 55) p= .492	-0.1342 (n = 55) p= .329	0.8964 (n = 55) p= .000
FCONTLCU	0.2649 (n = 54) p= .053	0.0669 (n = 55) p= .628	-0.1127 (n = 55) p= .413	0.0765 (n = 55) p= .579	0.09 (n = 55) p= .513	0.776 (n = 55) p= .000
CNBMR	0.3871 (n = 54) p= .004	0.1075 (n = 55) p= .435	-0.0896 (n = 55) p= .515	0.0257 (n = 55) p= .852	0.2723 (n = 55) p= .044	0.2483 (n = 55) p= .068
CNBMCDR	0.3009 (n = 54) p= .027	0.0534 (n = 55) p= .698	0.0393 (n = 55) p= .776	0.102 (n = 55) p= .459	0.1286 (n = 55) p= .350	0.127 (n = 55) p= .355

	MCONTLCU	FWARMTH	FWARMCDR	FWARMDR	FWARMCUR	FCONTROL
CNBMDR	0.5433 (n = 54) p= .000	-0.0085 (n = 55) p= .951	-0.172 (n = 55) p= .209	-0.0153 (n = 55) p= .911	0.1042 (n = 55) p= .449	0.2546 (n = 55) p= .061
CNBMCUR	0.0819 (n = 54) p= .556	0.1311 (n = 54) p= .345	0.0215 (n = 54) p= .877	-0.025 (n = 54) p= .858	0.2228 (n = 54) p= .105	0.094 (n = 54) p= .499
CNBFR	-0.0224 (n = 54) p= .872	-0.0217 (n = 55) p= .875	-0.0774 (n = 55) p= .575	-0.0518 (n = 55) p= .707	0.1695 (n = 55) p= .216	0.114 (n = 55) p= .407
CNBFCDR	0.027 (n = 54) p= .847	0.2669 (n = 55) p= .049	0.2617 (n = 55) p= .054	0.0733 (n = 55) p= .595	0.1087 (n = 55) p= .429	-0.0265 (n = 55) p= .848
CNBFDR	-0.0678 (n = 54) p= .626	-0.0711 (n = 55) p= .606	0.0354 (n = 55) p= .798	-0.1645 (n = 55) p= .230	-0.0023 (n = 55) p= .987	0.1992 (n = 55) p= .145
CNBFCUR	-0.022 (n = 54) p= .874	0.0383 (n = 55) p= .781	-0.089 (n = 55) p= .518	0.0508 (n = 55) p= .713	0.2359 (n = 55) p= .083	0.0239 (n = 55) p= .862

	FCONTLCD	FCONTLDR	FCONTLCU	CNBMR	CNBMCDR	CNBMDR
AGE MOS.	-0.1444 (n = 55) p= .293	-0.1733 (n = 55) p= .206	-0.049 (n = 55) p= .723	-0.0761 (n = 55) p= .581	-0.1975 (n = 55) p= .148	-0.1773 (n = 55) p= .195
CHILD SEX	-0.0672 (n = 55) p= .626	-0.0995 (n = 55) p= .470	0.014 (n = 55) p= .919	-0.0152 (n = 55) p= .912	0.132 (n = 55) p= .337	0.2337 (n = 55) p= .086
FATHER ED.	0.1053 (n = 55) p= .444	-0.0279 (n = 55) p= .840	0.0668 (n = 55) p= .628	0.0905 (n = 55) p= .511	0.1266 (n = 55) p= .357	0.1892 (n = 55) p= .166
MOTHER ED.	0.2047 (n = 55) p= .134	0.0921 (n = 55) p= .503	0.1673 (n = 55) p= .222	0.224 (n = 55) p= .100	0.2324 (n = 55) p= .088	0.1842 (n = 55) p= .178
ROM	0.0571 (n = 52) p= .687	0.0852 (n = 52) p= .548	0.005 (n = 52) p= .972	0.2129 (n = 52) p= .130	0.2799 (n = 52) p= .044	0.2084 (n = 52) p= .138
MWARMTH	0.0726 (n = 55) p= .598	-0.0303 (n = 55) p= .826	-0.061 (n = 55) p= .658	0.0199 (n = 55) p= .885	0.2682 (n = 55) p= .048	0.0662 (n = 55) p= .631
MWARMCDR	0.1674 (n = 55) p= .222	0.0632 (n = 55) p= .646	0.0849 (n = 55) p= .538	-0.0876 (n = 55) p= .525	0.0183 (n = 55) p= .894	-0.1068 (n = 55) p= .438

	FCONTLCD	FCONTLDR	FCONTLCU	CNBMR	CNBMCDR	CNBMDR
MWARMDR	-0.1087 (n = 55) p= .429	-0.0557 (n = 55) p= .686	-0.1378 (n = 55) p= .316	0.0849 (n = 55) p= .538	0.4175 (n = 55) p= .002	0.0295 (n = 55) p= .831
MWARMCUR	0.0015 (n = 54) p= .992	-0.044 (n = 54) p= .752	-0.1899 (n = 54) p= .169	-0.002 (n = 54) p= .988	0.0769 (n = 54) p= .581	0.0511 (n = 54) p= .714
MCONTROL	-0.0544 (n = 55) p= .693	0.2596 (n = 55) p= .056	0.4219 (n = 55) p= .001	0.4886 (n = 55) p= .000	0.2502 (n = 55) p= .065	0.6804 (n = 55) p= .000
MCONTLCD	-0.0486 (n = 55) p= .725	0.2336 (n = 55) p= .086	0.2397 (n = 55) p= .078	-0.0797 (n = 55) p= .563	0.1316 (n = 55) p= .338	0.008 (n = 55) p= .954
MCONTLDR	-0.0523 (n = 55) p= .704	0.291 (n = 55) p= .031	0.3345 (n = 55) p= .013	0.4457 (n = 55) p= .001	0.2156 (n = 55) p= .114	0.6599 (n = 55) p= .000
MCONTLCU	0.0104 (n = 54) p= .941	0.1468 (n = 54) p= .289	0.2649 (n = 54) p= .053	0.3871 (n = 54) p= .004	0.3009 (n = 54) p= .027	0.5433 (n = 54) p= .000
FWARMTH	0.3411 (n = 55) p= .011	-0.0402 (n = 55) p= .771	0.0669 (n = 55) p= .628	0.1075 (n = 55) p= .435	0.0534 (n = 55) p= .698	-0.0085 (n = 55) p= .951

	FCONTLCD	FCONTLDR	FCONTLCU	CNBMR	CNBMCDR	CNBMDR
FWARMCDR	0.3736 (n = 55) p= .005	-0.0837 (n = 55) p= .544	-0.1127 (n = 55) p= .413	-0.0896 (n = 55) p= .515	0.0393 (n = 55) p= .776	-0.172 (n = 55) p= .209
FWARMDR	0.2307 (n = 55) p= .090	0.0947 (n = 55) p= .492	0.0765 (n = 55) p= .579	0.0257 (n = 55) p= .852	0.102 (n = 55) p= .459	-0.0153 (n = 55) p= .911
FWARMCUR	0.1473 (n = 55) p= .283	-0.1342 (n = 55) p= .329	0.09 (n = 55) p= .513	0.2723 (n = 55) p= .044	0.1286 (n = 55) p= .350	0.1042 (n = 55) p= .449
FCONTROL	0.414 (n = 55) p= .002	0.8964 (n = 55) p= .000	0.776 (n = 55) p= .000	0.2483 (n = 55) p= .068	0.127 (n = 55) p= .355	0.2546 (n = 55) p= .061
FCONTLCD	1.0000 (n = 55) p= .	0.248 (n = 55) p= .068	0.1623 (n = 55) p= .236	-0.0616 (n = 55) p= .655	-0.0423 (n = 55) p= .759	0.0293 (n = 55) p= .832
FCONTLDR	0.248 (n = 55) p= .068	1.0000 (n = 55) p= .	0.539 (n = 55) p= .000	-0.0001 (n = 55) p=1.000	0.1925 (n = 55) p= .159	0.1121 (n = 55) p= .415
FCONTLCU	0.1623 (n = 55) p= .236	0.539 (n = 55) p= .000	1.0000 (n = 55) p= .	0.4229 (n = 55) p= .001	0.0504 (n = 55) p= .715	0.3192 (n = 55) p= .018

	FCONTLCD	FCONTLDR	FCONTLCU	CNBMR	CNBMCDR	CNBMDR
CNBMR	-0.0616 (n = 55) p= .655	-0.0001 (n = 55) p=1.000	0.4229 (n = 55) p= .001	1.0000 (n = 55) p= .	0.2115 (n = 55) p= .121	0.6723 (n = 55) p= .000
CNBMCDR	-0.0423 (n = 55) p= .759	0.1925 (n = 55) p= .159	0.0504 (n = 55) p= .715	0.2115 (n = 55) p= .121	1.0000 (n = 55) p= .	0.2774 (n = 55) p= .040
CNBMDR	0.0293 (n = 55) p= .832	0.1121 (n = 55) p= .415	0.3192 (n = 55) p= .018	0.6723 (n = 55) p= .000	0.2774 (n = 55) p= .040	1.0000 (n = 55) p= .
CNBMCUR	-0.1048 (n = 54) p= .451	-0.1296 (n = 54) p= .350	0.2878 (n = 54) p= .035	0.7774 (n = 54) p= .000	-0.0503 (n = 54) p= .718	0.1841 (n = 54) p= .183
CNBFR	-0.0494 (n = 55) p= .720	0.0546 (n = 55) p= .692	0.0713 (n = 55) p= .605	0.4348 (n = 55) p= .001	0.2675 (n = 55) p= .048	0.2284 (n = 55) p= .094
CNBFCDR	0.333 (n = 55) p= .013	-0.1265 (n = 55) p= .357	-0.1312 (n = 55) p= .340	-0.0495 (n = 55) p= .720	-0.0496 (n = 55) p= .719	-0.0103 (n = 55) p= .941
CNBFDR	0.199 (n = 55) p= .145	0.2018 (n = 55) p= .140	0.03 (n = 55) p= .828	0.0438 (n = 55) p= .751	0.1635 (n = 55) p= .233	0.1573 (n = 55) p= .251

	FCONTLCD	FCONTLDR	FCONTLCU	CNBMR	CNBMCDR	CNBMDR
CNBFCUR	-0.1695 (n = 55) p= .216	-0.0461 (n = 55) p= .738	0.0672 (n = 55) p= .626	0.4657 (n = 55) p= .000	0.2604 (n = 55) p= .055	0.1665 (n = 55) p= .224

	CNBMCUR	CNBFR	CNBFCDR	CNBFDR	CNBFCUR
AGE MOS.	-0.0759 (n = 54) p= .585	-0.2776 (n = 55) p= .040	0.0577 (n = 55) p= .676	-0.3834 (n = 55) p= .004	-0.1969 (n = 55) p= .150
CHILD SEX	-0.2299 (n = 54) p= .094	0.0291 (n = 55) p= .833	-0.1336 (n = 55) p= .331	0.07 (n = 55) p= .611	0.0189 (n = 55) p= .891
FATHER ED.	-0.0448 (n = 54) p= .748	-0.0306 (n = 55) p= .825	0.0327 (n = 55) p= .813	0.0803 (n = 55) p= .560	-0.0622 (n = 55) p= .652
MOTHER ED.	0.2081 (n = 54) p= .131	0.175 (n = 55) p= .201	-0.0507 (n = 55) p= .713	0.3652 (n = 55) p= .006	0.0274 (n = 55) p= .843
ROM	0.1124 (n = 51) p= .432	-0.0291 (n = 52) p= .838	0.0183 (n = 52) p= .897	-0.1067 (n = 52) p= .451	-0.0127 (n = 52) p= .929

	CNBMCUR	CNBFR	CNBFCDR	CNBFDR	CNBFCUR
MWARMTH	0.0169 (n = 54) p= .903	-0.0773 (n = 55) p= .575	-0.2898 (n = 55) p= .032	-0.0608 (n = 55) p= .659	-0.0391 (n = 55) p= .777
MWARMCDR	-0.0106 (n = 54) p= .939	-0.1759 (n = 55) p= .199	-0.2725 (n = 55) p= .044	-0.1223 (n = 55) p= .374	-0.1391 (n = 55) p= .311
MWARMDR	0.05 (n = 54) p= .719	0.0333 (n = 55) p= .809	-0.256 (n = 55) p= .059	-0.1193 (n = 55) p= .386	0.1084 (n = 55) p= .431
MWARMCUR	0.0798 (n = 54) p= .566	-0.1068 (n = 54) p= .442	-0.0729 (n = 54) p= .601	-0.0793 (n = 54) p= .569	-0.0961 (n = 54) p= .490
MCONTROL	0.1309 (n = 54) p= .345	0.0035 (n = 55) p= .980	-0.1462 (n = 55) p= .287	-0.0502 (n = 55) p= .716	-0.0175 (n = 55) p= .899
MCONTLCD	-0.1436 (n = 54) p= .300	-0.0324 (n = 55) p= .815	-0.1173 (n = 55) p= .394	0.147 (n = 55) p= .284	-0.1082 (n = 55) p= .432
MCONTLDR	0.0965 (n = 54) p= .488	0.0124 (n = 55) p= .928	-0.1368 (n = 55) p= .319	-0.0866 (n = 55) p= .530	-0.0003 (n = 55) p= .998

	CNBMCUR	CNBFR	CNBFCDR	CNBFDR	CNBFCUR
MCONTLCU	0.0819 (n = 54) p= .556	-0.0224 (n = 54) p= .872	0.027 (n = 54) p= .847	-0.0678 (n = 54) p= .626	-0.022 (n = 54) p= .874
FWARMTH	0.1311 (n = 54) p= .345	-0.0217 (n = 55) p= .875	0.2669 (n = 55) p= .049	-0.0711 (n = 55) p= .606	0.0383 (n = 55) p= .781
FWARMCDR	0.0215 (n = 54) p= .877	-0.0774 (n = 55) p= .575	0.2617 (n = 55) p= .054	0.0354 (n = 55) p= .798	-0.089 (n = 55) p= .518
FWARMDR	-0.025 (n = 54) p= .858	-0.0518 (n = 55) p= .707	0.0733 (n = 55) p= .595	-0.1645 (n = 55) p= .230	0.0508 (n = 55) p= .713
FWARMCUR	0.2228 (n = 54) p= .105	0.1695 (n = 55) p= .216	0.1087 (n = 55) p= .429	-0.0023 (n = 55) p= .987	0.2359 (n = 55) p= .083
FCONTROL	0.094 (n = 54) p= .499	0.114 (n = 55) p= .407	-0.0265 (n = 55) p= .848	0.1992 (n = 55) p= .145	0.0239 (n = 55) p= .862
FCONTLCD	-0.1048 (n = 54) p= .451	-0.0494 (n = 55) p= .720	0.333 (n = 55) p= .013	0.199 (n = 55) p= .145	-0.1695 (n = 55) p= .216

	CNBMCUR	CNBFR	CNBFCDR	CNBFDR	CNBFCUR
FCONTLDR	-0.1296 (n = 54) p= .350	0.0546 (n = 55) p= .692	-0.1265 (n = 55) p= .357	0.2018 (n = 55) p= .140	-0.0461 (n = 55) p= .738
FCONTLCU	0.2878 (n = 54) p= .035	0.0713 (n = 55) p= .605	-0.1312 (n = 55) p= .340	0.03 (n = 55) p= .828	0.0672 (n = 55) p= .626
CNBMR	0.7774 (n = 54) p= .000	0.4348 (n = 55) p= .001	-0.0495 (n = 55) p= .720	0.0438 (n = 55) p= .751	0.4657 (n = 55) p= .000
CNBMCDR	-0.0503 (n = 54) p= .718	0.2675 (n = 55) p= .048	-0.0496 (n = 55) p= .719	0.1635 (n = 55) p= .233	0.2604 (n = 55) p= .055
CNBMDR	0.1841 (n = 54) p= .183	0.2284 (n = 55) p= .094	-0.0103 (n = 55) p= .941	0.1573 (n = 55) p= .251	0.1665 (n = 55) p= .224
CNBMCUR	1.0000 (n = 54) p= .	0.2728 (n = 54) p= .046	-0.0713 (n = 54) p= .608	-0.0139 (n = 54) p= .920	0.3098 (n = 54) p= .023
CNBFR	0.2728 (n = 54) p= .046	1.0000 (n = 55) p= .	0.0064 (n = 55) p= .963	0.6854 (n = 55) p= .000	0.9222 (n = 55) p= .000

	CNBMCUR	CNBFR	CNBFCDR	CNBFDR	CNBFCUR
CNBFCDR	-0.0713 (n = 54) p= .608	0.0064 (n = 55) p= .963	1.0000 (n = 55) p= .	-0.0677 (n = 55) p= .623	-0.0086 (n = 55) p= .950
CNBFDR	-0.0139 (n = 54) p= .920	0.6854 (n = 55) p= .000	-0.0677 (n = 55) p= .623	1.0000 (n = 55) p= .	0.4088 (n = 55) p= .002
CNBFCUR	0.3098 (n = 54) p= .023	0.9222 (n = 55) p= .000	-0.0086 (n = 55) p= .950	0.4088 (n = 55) p= .002	1.0000 (n = 55) p= .

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